

87

# **"QUALITY" IN URBAN MANAGEMENT**

by

**Errol van Amsterdam**

Dissertation submitted in part-fulfillment of the requirements of the Masters in Engineering Management in the School of Civil Engineering at the University of Cape Town.

Date of submission: June 1999

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

# TABLE OF CONTENTS

	<u>Page no.</u>
ACKNOWLEDGEMENTS	1
CHAPTER 1 - INTRODUCTION	2
1.1 Urban Management and Total Quality Management	4
1.2 Total Quality Management (TQM)	4
1.2.1 Historical Foundations	5
1.2.2 Benefits of TQM	7
1.2.3 Existing TQM models/Conceptual Frameworks	8
1.3 Urban Management	11
1.4 Motivation for the Study	13
1.5 Problem Statement	15
1.6 Objectives of the Study	15
1.7 Research Hypotheses	16
1.8 Overview	17
CHAPTER 2: HISTORY AND DEVELOPMENT OF QUALITY	18
2.0 Introduction	18
2.1 Rome	20
2.1.1 Cities and urban quality	24
2.2 Germany	25
2.3 Russia	26
2.4 Britain	27
2.4.1 The Hallmarking concept	28
2.4.2 The dawn of innovation and modern product quality	28
2.4.3 The growth of industrial standards	28
2.5 Japan	29
2.6 Quality Initiatives – post 1980s	32
2.6.1 Customer focus	32
2.6.2 Training for Quality	33
2.6.3 Total Quality Management (TQM)	34
CHAPTER 3: ISO 9000 + ISO 14000 SERIES	36
3.1 Introduction	36
3.2 Definitions and Terms	37
3.2.1 Quality Assurance	37
3.2.2 Quality System	38
3.2.3 Quality Manual	38
3.2.4 Quality Policy	39

3.2.5	Quality Management	39
3.2.6	Corrective Action	39
3.2.7	Total Quality Management	39
3.3	ISO 9000	40
3.4	Quality Concepts	41
3.4.1	Quality as defined in the Standards	42
3.4.2	Quality Management	42
3.4.2.1	Objective of Quality Management	44
3.4.3	Operation of a Quality System	44
3.4.4	Quality Improvement	45
3.5	ISO 14000	48
3.6	Comparison of ISO 9000 and ISO 14000	49
3.7	Elements of ISO 14001	52
3.8	Conclusion	55
 CHAPTER 4: URBAN MANAGEMENT		 57
4.1	Introduction	57
4.2	Government	58
4.2.1	Governance	58
4.3	Economics	61
4.3.1	Urban growth	61
4.3.2	Public administration	63
4.3.3	Urban economy	64
4.3.4	Environmental considerations	66
4.3.5	Road pricing	66
4.3.6	Policy	67
4.4	Decentralization	71
4.5	Service delivery	74
4.5.1	The lack of delivery of a full range of services	76
4.5.2	Equitable distribution of the service	76
4.5.3	Courtesy and respect with which service is provided	76
4.5.4	Response time in providing a service	76
4.5.5	Amount of citizen use of a service	77
4.5.6	Citizen perceptions of their satisfaction with a service	77
4.5.7	The efficiency of providing the service	77
4.5.8	Benefits from measuring public service quality	78
4.5.9	What is to be measured?	79
4.6	Systems analysis	80
4.6.1	Systems analysis in an urban complex	82
4.7	Quality of life	83
4.8	Community participation	83
4.8.1	Aims of re-organization	86
4.9	Public/Private sector	87
4.9.1	Participation: worker-initiated	91
4.9.2	Participation: management-initiated	91

4.9.3	The Japanese Quality Circles	91
<b>CHAPTER 5: TOTAL QUALITY MANAGEMENT (TQM)</b>		<b>93</b>
5.1	Definition	93
5.2	Historical foundations of TQM	95
5.3	Benefits of TQM	97
5.4	Existing TQM models/conceptual frameworks	98
5.5	TQM and urban management	99
5.6	Role of management	101
5.7	TQM tools and techniques	108
5.7.1	The seven (old) tools of quality control	108
5.7.2	The Deming cycle	112
5.7.3	Statistical Process Control (SPC)	113
5.7.4	The seven (new) tools of quality control	113
5.7.4.1	Relation diagrams	113
5.7.4.2	Affinity diagrams	113
5.7.4.3	Tree diagram	113
5.7.4.4	Matrix diagram	114
5.7.4.5	Matrix data analysis	114
5.7.4.6	Process decision program chart (PDPC)	114
5.7.4.7	Arrow diagrams	114
5.8	Employee participation	122
5.8.1	Training	122
5.8.2	Quality Circles	123
5.9	TQM implementation	124
<b>CHAPTER 6: APPLICATION OF TQM TO URBAN MANAGEMENT</b>		<b>127</b>
6.1	Introduction	127
6.2	History of Quality	128
6.3	ISO 9000 + 14000	130
6.4	Total Quality Management	131
6.5	Urban Management	133
6.6	Starting a TQM system	135
6.7	Conclusion	136
6.8	Areas of further Research	139
<b>REFERENCES</b>		<b>140</b>

## **ACKNOWLEDGEMENTS**

I take this opportunity of thanking my Maker, who has given me the presence of mind, will power and inspiration to complete this document.

A great debt of gratitude is owed to Michael Blackmore, friend and colleague, who inspired me in undertaking this topic for research. His advice and encouragement as well as his niggling enquiry, was to me a constant reminder of my progress and continued application. He has been a source of knowledge, particularly patient but yet critical of the text and has provided useful comments and information for which I am thankful.

Benoit Verhaeghe, my advisor, for his valuable comments and information shared through some of his literature on the topic of quality management, provided much needed input in understanding and completion of this thesis.

I wish to thank Tanya for her patience and moral support as well as her valued assistance in typing up some of the text.

To Michael de Leeuw, thank you for your time to proof read this document.

Last but not least, I wish to thank everyone who contributed towards me completing my thesis.

# CHAPTER 1

## INTRODUCTION

The inefficient manner in which South African cities are being managed has long been a cause for concern. Various reasons can be put forward as to why this is so but the reality of the matter is that urban residents are not getting the desired service due to lack of proper management.

It is widely accepted that Urban Management and Total Quality Management are two spheres of activity that do not have a “natural” historical linkage. However, it is the purpose of this study to show that there is a need to apply the strong managerial focus of total quality management to the efficient and effective management of South African cities and that through this process, the customer, in this case the citizens of the city will benefit through improved service delivery.

Historically, cities have suffered under poor public administration but this is now changing to embrace the private sector and their perceived expertise. In the past, service delivery was seen as being provided within the context of “public service” but with the growing privatization drive and rethinking of the way in which cities are managed, this is now changing and new ways of defining, providing and measuring service are required.

With the increasing urbanization in South Africa, the urban centres begin to experience the problems typical of many African cities in terms of physical and social amenities. In particular, there is a large increase in the demand for physical infrastructure at a time when South Africa’s ability to supply it is constrained by uncertain economic expectations.

Quality management, often perhaps the only way forward, relates in the way that it impacts on the supply of goods or services that are intended to satisfy the customers’ needs and requirements at all times (ISO 9000+: 2000)<sup>1</sup>- municipal services included. A major purpose of quality management is to

improve the systems and processes so that continual improvement of quality can be achieved and in so doing improve economic performance through efficiency.

Total Quality management with its links to the manufacturing industry can also be applied to other areas within engineering. Municipal engineering, like other industries throughout the world, is embracing the concept of total quality management (TQM) as a means to enhance its competitiveness. South Africa is just recently following suit embracing quality management issues, however the philosophy behind TQM as implemented in other countries is still new. Factors that contribute to the uniqueness of engineering projects are no longer thought to be obstacles to TQM adoption. Rather, it is realized that in managing an urban environment it must adapt the application of TQM principles to its processes in a manner that is in tune with its special circumstances.

Since the late 1980's, experts have warned of impending problems if the industry fails to take revolutionary steps required to transform the industry to one that cultivates innovation, teamwork and continuous process improvement (Burati et al, 1992b)<sup>2</sup>. The failure of the industry to proactively recognize and act upon changing environmental and global conditions is reflected in the multi-faceted nature of the problems it now faces.

A number of prior studies have investigated the relationship between TQM practices and organizational performance outcomes in the manufacturing industry (Ahire<sup>3</sup> et al 1996; Flynn<sup>4</sup> et al 1994; Grandzol and Gershon<sup>5</sup> 1997; Saraph<sup>6</sup> et al 1989). Because of the expected relationship between quality management practices and quality-related performance outcomes, the performance outcomes considered in these studies have been mostly confined to quality-related measures such as perceived customer satisfaction. However, one of the tenets of TQM is a focus on continuous improvement of key processes. As a result, the implementation of TQM ultimately should have a positive effect on any processes associated with important



performance measures, even those performance measures that are not traditionally affiliated with quality.

## **1.1 Urban Management and Total Quality Management**

Urban Management functions are to provide customers with products eg transport, housing, services, etc that meet their needs. Its goals are to do this in a manner that results in satisfaction for its customers and profitability for the industry. However, during the past decades, the ability to meet these goals have been seriously impaired by internal and external problems.

Poor quality and its associated costs have been significant antecedents of the urban decline for example quality problems in the construction industry are a result of weaknesses or failures in the design-construct-manage process.

Ahmed<sup>7</sup> and Kangari 1995 contend that a primary reason for the high levels of owner initiated changes and design errors during a construction project may be due to the industry's inability to accurately determine and satisfy the needs of its customers. Fortunately, the customer-oriented philosophy of TQM offers a prescription for these and other quality problems that plague the urban environment.

For an organization to remain competitive in an ever-changing environment can only be achieved through dramatically altering their management strategies. This is evident by the same challenges the industrial world faced during the 1980's and the Japanese industry during the 1970's (Burati et al 1992b)<sup>2</sup>

## **1.2 Total Quality Management (TQM)**

Total quality management is a management philosophy that has helped to metamorphose components and industries in major industrialized countries around the globe. The term TQM is widely accepted to mean a comprehensive strategic and management philosophy based on continuously

improving quality, with the goal of providing satisfaction to the customer, the first and every time. While no universal definition of TQM exists (Garvin<sup>8</sup> 1988; Reeves and Bednar<sup>9</sup> 1994) the principles associated with TQM philosophy typically centre around two important concepts: customer satisfaction and continuous process and product improvement (Omanchonu<sup>10</sup> and Ross 1994). The fundamental goals and operating methodologies of TQM, as practiced are primarily based upon works of quality experts Deming<sup>11</sup> and Juran<sup>12</sup>, who were instrumental in helping the Japanese attain prominence in the global marketplace after World War II (Chase<sup>13</sup> 1993; Graves<sup>14</sup> 1993).

### *1.2.1 Historical Foundations*

According to some researchers, Deming's well-known 14 points, form the core of the total quality management philosophy and as originally set forth by Deming, are applicable to all industry types (Chase<sup>13</sup> 1993). Deming's prescription for beleaguered Japanese managers was to improve their products by managing the quality of their processes. Building upon ideas and techniques learned from Shewhart, Deming taught the Japanese the concepts of statistical process control (SPC) and the importance of quality responsibility and improvement. Like Deming, Juran was instrumental in the Japanese economic turnaround following World War II. Whereas Deming stressed the need for change and a focus on quality at all organizational levels, Juran emphasized the key role management plays in the quality improvement process.

The teachings of Deming and Juran, as well as other quality specialists, were later adopted by Japanese construction owners and contractors in the 1970's and by the US managers in both the manufacturing and service industries in the 1980's (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993). Notwithstanding the subsequent success of the TQM philosophy in helping to turn around both Japanese and US industries in general, leaders have been slow to recognize the potential benefits of TQM (Kubal<sup>15</sup> 1996). However, executives and managers now have begun to realize the benefits of the systems perspective of TQM in addressing inter-organizational and intra-organizational problems.

The concept of “customer” is broader in scope in the context of TQM than in the traditional business environment. A customer in the traditional management environment is the purchaser of a product or service; in the construction industry for example, this is the final owner of the constructed project. However, in a TQM-based environment, a customer is anyone who depends upon the output of others.

The TQM principles of continuous process improvement with the goal of achieving customer satisfaction, can therefore be an effective means of improving quality at every process level if an organization is willing to rethink many of its basic operating principles, including fundamental meaning of who constitutes a customer.

Prescriptive measures for applying TQM in urban management related contexts abound in the literature. Researchers have developed models (Chase<sup>16</sup> and Federle 1992; Chase<sup>13</sup> 1993), described frameworks (Burati<sup>2</sup> et al 1992a; Strange<sup>17</sup> and Vaughan 1993) and made recommendations (Federle<sup>18</sup> and Chase 1993) useful toward the implementation of TQM. As a counter-point to the work of experts that extol the benefits of TQM in industry, Demski<sup>19</sup> (1993) presents a cautionary treatise on the value of identifying potential sources of resistance to fundamental organizational change such as is required by TQM, and discusses the importance of corporate culture and leadership in the successful implementation of TQM.

As is evident from the literature surveys, the preponderance of existing research is focussed on prescriptive measures for the implementation of TQM in the general urban context. However, few attempts have been made to empirically investigate the impact of TQM on actual performance outcomes for any particular field within the engineering management context. One reason for this may be that many in the industry have shown reluctance to embrace TQM as a management strategy. A source of this reluctance may be because of the relatively widely-held belief that TQM is for the manufacturing sector alone, and is not suitable for any other service related sector (Griffis<sup>20</sup> 1992).

### 1.2.2 *Benefits of TQM*

Literature studies show that there is a wealth of company executives who have recognised TQM's potential. Burati reports that in the early 1980's, owners of multi-faceted organizations who had successfully implemented TQM in their main manufacturing business began to "adapt TQM to their engineering and construction programs" (1993, page 456). The experiences of these and other TQM pioneers have provided frameworks for applying TQM principles to the various disciplines contained within urban management. Thus proponents of TQM offer the following as evidence of the applicability of TQM for these disciplines:

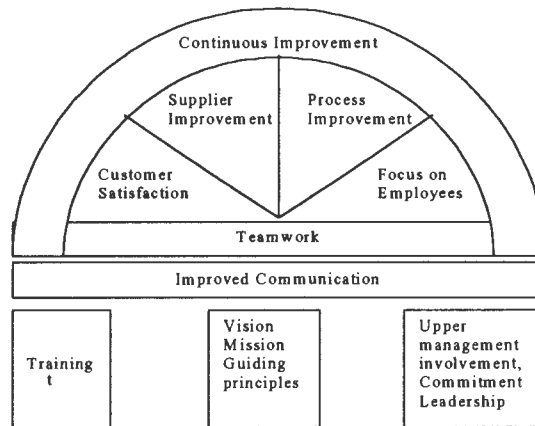
Many of the functions associated with engineering projects are common across the design and construction techniques (Chase<sup>13</sup> 1993), and are therefore responsive to continuous process improvement.

By doing a quality job, expensive rework and maintenance is minimized (Burati<sup>2</sup> et al 1992a). "Improving the process and thereby avoiding defects is usually less costly than the typical approach of attempting after the fact to inspect out defects"

Training and education of the workforce has much in common with the techniques used for safety training and awareness (Burati<sup>2</sup> et al 1992b) Short-term costs to implement changes to improve quality will return long-term dividends many times greater than the costs (Culp<sup>21</sup> et al 1993) The track records of some organizations affirm that TQM is not only a viable option, but a potentially successful one. In addition, TQM provides organizations with the opportunity to:

- Increase their success rate in a competitive environment;
- Save millions of rands through waste elimination;
- Improve profitability margins and schedules; and
- Decrease unnecessary and expensive activities.

### 1.2.3 Existing TQM models/Conceptual Frameworks

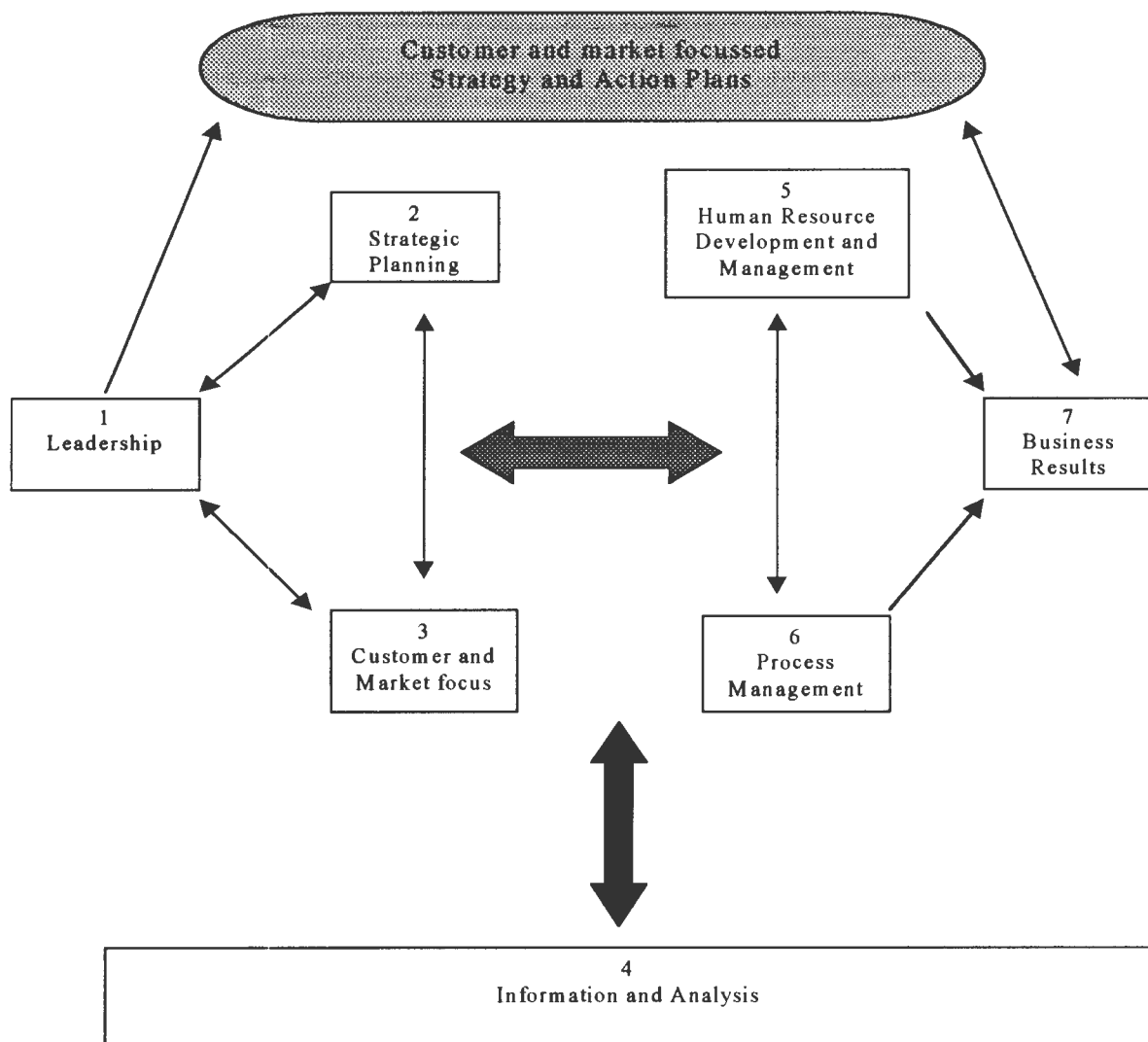


**Figure 1**

A number of TQM models and conceptual frameworks exist in the literature (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993; Graves<sup>14</sup> 1993; Strange and Vaughan<sup>17</sup> 1993). For example, Chase<sup>13</sup> (1993) developed a 10-element model for TQM based on the input of contractors with formal quality-management programs shown in Figure 1. In many respects, these models do not radically differ from the fundamental principles typically associated with TQM – it is the implementation of the principles that is idiosyncratic to the industry.

Although the existing models for TQM vary somewhat, key elements of these models include:

- Top-management leadership in and an unwavering commitment to the TQM program.
- An organizational structure designed to support the TQM effort – often with key personnel assigned to oversee the TQM program.
- Improved communication both within organizational frameworks and across organizational boundaries.
- Training in TQM principles and practices for all managers and employees.
- Process improvement through statistical process control (SPC)
- Customer satisfaction as the ultimate goal for every employee.
- Supplier involvement and improvement
- A focus on employee involvement
- Continuous improvement.



**Figure 2**

In contrast to some of the industry specific principles and practices described, the general TQM literature offers conceptual frameworks and models that are purported to be applicable across all industries. For example the Malcolm Baldrige National Quality Award<sup>22</sup> (MBNQA)(1997) shown as figure 2, offers a more general framework of TQM.

In general, there are commonalties between the TQM models and frameworks proposed for use by the engineering management continuum and those presented in the literature that claim to transcend the boundaries of a particular industry. Many are anecdotal or descriptive in nature (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993; Crosby<sup>23</sup> 1979; Deming<sup>11</sup> 1986; Juran<sup>12</sup> 1988; MBNQA<sup>26</sup> 1997), but others have been empirically derived (Ahire<sup>3</sup> et al 1996; Anderson<sup>24</sup> et al 1994; Black and Porter<sup>25</sup> 1996; Flynn<sup>4</sup> et al 1994; Saraph<sup>6</sup> et al 1989). Many other constructs are considered as either relevant, offering

differing approaches or considered part of TQM or leaning towards the successful implementation of TQM. The literature clearly states the necessity for top-management commitment, improved communication and adequate training and education within the ranks at all levels from management down to shop floor.

### **1.3 Urban Management**

Urban Management deals with the effective and efficient administration of an entire city using a variety of strategic themes to encourage investment, promote economic development, integrate and manage growth, creating institutions for delivery and building habitable and safe environments (World Bank<sup>26</sup> 1991).

Essentially the role of urban governance can be divided into four tasks as defined by Rondinelli<sup>27</sup> (1990) ie:

- Providing infrastructure essential to the efficient operation of cities;
- Providing services that develop human resources, improve productivity and raise the standard of living of urban residents;
- Regulating private activities that affect community welfare and the health and safety of the urban population; and
- Providing services and facilities that support productive activities and allow private enterprise to operate efficiently in urban areas.

Undertaking these tasks is in itself a huge hurdle to cross because of problems highlighted in this paper i.e. fragmentation of city structures, poor management capabilities, inadequate service delivery, inefficiency and lack of customer participation.

Though there are many dimensions to the urban crisis, clearly the task of improving the capacity of government to deliver services is critical. The problems are complex, and it will be necessary to devise comprehensive



formulae for increasing the effectiveness of urban governments. Whether there is the wisdom and the imagination around to develop and implement multi-dimensional approaches to the problems of urban management, is uncertain.

Creating a strong centre with vastly improved management capabilities is essential. One perennial strategy for improving the delivery of urban services is government reorganization. The two burning questions are:

- how organizational change can be achieved?
- how change can be institutionalized?

As compared with hopeful plans for community control, the quest for improved public services is a more modest and limited urban “solution”. In particular, it represents a new emphasis on everyday urban problems and on the capacity of government to perform basic functions. A major limitation of urban systems analysis is the virtual lack of suitable management information system support for these activities (Hawley<sup>28</sup> and Rogers 1974). The relationship between government and urban residents in service delivery is constant, salient, and tangible: all of which we might expect would stimulate citizen interests and demands on government. On the other hand, citizen interests and demands are fragmented by the very nature of urban public services. That is, because urban services are personal, direct, and locality-specific – in terms of both delivery and citizen needs – highly divisible. In terms of delivery, urban services, in contrast to pure public goods like national defense, can easily be “divided” – allocated differentially to different groups of citizens.

Davey<sup>29</sup> (1992) writes that governments can benefit by arranging for private-sector agencies to perform public interest services by taking advantage of the following:

- advantages of competition, not only between private and public sector agencies but also between private organizations.
- Economies of scale and specialization.

There is both opportunity and need for greater involvement of private organizations in public interest services, particularly social services.

Examples are privatization of waste removal currently operated by WasteTech which is proving to be successful compared to say street cleaning performed by the Local Authority, that is undergoing difficulties due to low productivity and high costs.

Business executives trained in management techniques – planning, goal-setting, organizing, controlling, performance appraisal, work flow analysis, and the like – have a lot to offer the public sector to make it more productive, and in some instances to promote organizational change as well (Hawley<sup>32</sup> 1974).

However, the criteria fail to include some of the essentials needed to attain world-class quality, such as personal leadership by the top managers; training the hierarchy in managing for quality; quality goals in the business plan; maintaining a revolutionary rate of quality improvement; participation and empowerment of the workforce.

#### **1.4 Motivation for this study**

City management has been grappling with a number of problems on various fronts including housing, through education to transportation and planning. But a common theme that cuts across all of these sectors is the problem of achieving quality, productivity and service delivery. Some of these sectors have begun to deal with their problems by following the lead of the manufacturing industry in embracing TQM. As related earlier, TQM provides a framework for improving quality and productivity through continuous process improvement based on a customer-oriented focus. Thus, in the context of TQM, a customer may be internal, i.e. an employee of the firm, or external, i.e. a client or a member of the community. The goal of project participants is to perform the work in a manner that leads to customer satisfaction for both internal and external customers.

In the light of this goal, findings that have emerged from the literature search, indicate that any aspect of city management, including quality, can be managed by focussing on process improvement. The successful implementation of TQM in an urban environment has the potential to not only improve key quality performance outcomes, but also improve the efficiency of a city. To this end, it is important to determine if, and to what extent, the implementation of TQM practices can positively impact on city management.

Even though TQM is currently viewed as a viable management strategy, the operating environment of urban management has one characteristic that tends to set it apart from many manufacturing sectors – this “industry” is highly fragmented (Howard<sup>30</sup> et al. 1989). This fragmentation has precluded an integrated approach to process and product management. However, TQM affords the industry the opportunity to overcome the adverse effects of fragmentation, and its related phenomenon, specialization, by creating a new paradigm in which client satisfaction becomes the primary goal. In this context, individual sectors or departments work in an integrated fashion toward improving process management so that the needs and requirements of the customer have priority over all other issues. Consequently, TQM has the capacity to diminish the effects of fragmentation, while it serves a framework for overall improvement in key performance measures.

South Africa is very weak in terms of supervisory leadership. It is important therefore, that investment should be made into the development of middle management and supervisory leadership. These two levels of management have to be mobilised before mobilization of the workers, otherwise they will be marginalized and alienated.

The improvement of quality in products and service should become national priority. There is the conception that quality begins with the understanding that only customers (internal and external) can define quality. However, quality management is not strategy, it is a new style of working/thinking – a dedication to quality and excellence.

The first and most critical element of TQM is leadership and support from top management. Top managers must be involved in establishing an environment that encourages change, risk-taking, pride in work and continuous improvement on behalf of all customers.

The most important and critical ingredient (after management responsibility) to achieving a quality commitment throughout an organisation, is employee involvement, empowerment and teamwork, i.e. participative management.

In an ever changing society with the focus on development and specifically urban management which is concerned with the policies, plans, programmes and practices that seek to ensure that population growth is matched by access to basic infrastructure, shelter and employment.

## **1.5 Problem Statement**

City management is struggling to improve its efficiency, effectiveness and image in an environment that is highly fragmented, and is therefore not conducive to integrated process management. Prevalent strategies for improving performance have been only marginally successful. It is postulated that TQM, with its focus on managed process improvement, is related to improved outcomes within each sector and the environment as a whole. Furthermore, TQM will reduce the effects of fragmentation, which in turn, will lead to improved productivity outcomes.

## **1.6 Objectives of the study**

The objectives of the research programme are the following:  
To determine the level of Quality Assurance, Quality Management and their institutionalisation internationally and in South Africa through the SABS ISO 9000 and ISO 14000 family of Standards:

1. Review of QA trends and status in South Africa, the role played by government and public sector bodies in stimulating the drive towards adoption of Quality Assurance.
3. The need for TQM in Urban Management in particularly the corporatization / privatisation scenarios; but regardless, arising from the entitlement of stakeholders to the best value for their local taxes.

TQM would be a comprehensive customer-focussed system aimed at all management levels (top management to front-line) to manage all departments for achieving customer satisfaction through involvement of all employees.

### **1.7 Research hypotheses**

Studies have shown that organizations/authorities/departments that practice the principles of TQM increase productivity, efficiency and effectiveness greater than those that do not engage in practices associated with TQM

Based on the stated objectives, the following hypotheses are postulated:

1. Productivity and performance outcomes are related to the level of fragmentation within an organization.
2. The need for improvement of administration, management and service delivery in urban management as well as that the application of a TQM framework to city management will greatly improve its operation and relationship to their customers.

## 1.8 Overview

This Paper brings two important and related issues of current and topical interest together, and argues that this provides an important element that is currently lacking in the urban management framework. It does this through the application of what until relatively recent times in even the advanced industrial economies, was seen as a tool of efficiency enhancement in the production of goods.

Quality Assurance and Management concepts are now firmly entrenched in the corporate approach to the more efficient production of both goods and services. Herein lies the justification for the line pursued in the pages which follow. The city role, as described, includes to a significant degree, the provision of space for accommodating economic activities. But through the city's role in administering, in promoting and controlling change, and in providing and distributing services which the community has determined to exercise control over itself, City Management impacts directly on the efficiency of **all** activities taking place within city limits.

## **CHAPTER 2**

### **HISTORY AND DEVELOPMENT OF QUALITY**

#### **2.0 Introduction**

Quality is a timeless concept, so the origins of the human approach to managing for quality are hidden in the mists of the ancient past.

The nuclear human organization unit was the family. Isolated families were forced to create self-sufficiency – to meet their own needs for food, clothing and shelter. There was division of work among family members. Production was for self-use, so the design, production and use of the product were all carried out by the same persons. While the technology was primitive, the co-ordination was superb.

Villages were created to serve other essential human requirements such as mutual defense and social needs. The creation of the village opened the way to further division of labour and to development of specialized skills. The experience derived from this intimate familiarity then enabled human ingenuity to take the first steps toward the evolution of technology.

Before today's situation in which factories manufacture most products, small-town or village workshops used to be the only suppliers of products. The owner of the workshop either worked alone or employed only a few operators. The nature of village life was such that each operator had an overall picture of the design, manufacture and selling of the product. The consumer often visited the workshop personally to state his needs, to accept delivery of the product or to return a faulty product.

A craftsman was recognized by the quality of his work ideally supposing that in making any product that craftsman would have a value system (quality

system) whereby he in turn would assess processed or raw materials used by him. After all, the reputation and future financial rewards of the craftsman were at stake. This resulted in the “quality mark” afforded by the craftsman to the goods he manufactured, in essence his guarantee of the product. The existence of this “quality mark” can be seen as a crude form of quality assurance by the craftsman and was his personal signature and assurance that quality of the goods was acceptable. This mark or seal is much like the quality symbol accorded to manufactured goods today e.g. SABS mark of approval and the ISO 9000 series. The display of this mark meant the craftsman was willing to stake his reputation on the manufactured product and was therefore taking responsibility for his labour.

As villages grew, they needed multiple craftsmen who then competed with each other. Much of this competition took place in the village marketplace. The interaction between buyer and seller meeting face-to-face was an essential element of trading as the quality of goods and workmanship was on display. Buyers were forced to be vigilant and protect themselves against poor quality products. In effect, the seller was responsible for supplying the goods but the buyer became responsible for supplying the “quality assurance”.

In due course the villages expanded into towns and cities, while improved transport opened the way to trade among regions. Under trade among regions, producer and user could no longer meet face-to-face in the marketplace. The buyers’ direct point of contact was now with some merchant rather than with the producer. All this reduced the quality protections inherent in the village marketplace to a point requiring inventions of new forms of quality assurance.

The twentieth century then brought about changes of a revolutionary nature. Some were technological, such as automation and the electronic computer. Others were changes in business management, such as the spectacular Japanese revolution in quality. Still others related to adoption of statistical methods for controlling quality through data collection and analysis (Deming<sup>31</sup>



1951). Collectively, these revolutions are leading producers to unprecedented achievements in quality of products.

This chapter represents the foundation to the development of the quality evolution throughout time. It starts with the Roman Empire which this author believes to be the start of the modern city as we know it today. We start the quality thread here and trace it as it developed through centuries and also cultures, culminating in Japan during the 1970s and 1980s where the intervention of the quality gurus, Juran and Deming cultivated the philosophy of quality management. This after they were shunted in United States of America and found a home in Japan.

The second point this chapter makes is one of tying together the development of urban cultures and city forms as introduced by the Romans to the management and participation of a successful quality system as undertaken by the Japanese.

## **2.1 Rome**

A brief description of quality management in ancient Rome must begin with a look at the organization of Roman society. Power was highly centralized. To maintain their prestige the ruling classes had to offer acceptable living conditions (a sort of minimum standard) to obtain the consent of the populations and thus legitimize their own position (Marco<sup>32</sup> 1984). In truth to satisfy the people's basic needs and organize displays of urban opulence and mass entertainment.

The Roman civilization was aggressive and expansionist and their objectives from the beginning was to conquer and control territories inhabited by other populations. To extend this realm, they needed up-to-date information on conditions even of the furthest corners of the empire.

The history of the great Roman roads, which became increasingly direct, rapid, and durable, and were furnished with numerous reference points, is the history of the information network created for that purpose by the central power in Rome. The function of these roads was to act as an information communication channel rather than as a general transport system.

Road construction is only one of the areas in which the ancient Romans' skills as builders supported the expansion and maintenance of the empire. These building skills relied heavily on the development and use of many of the basic tools and concepts of managing for quality. These are particularly apparent in three activities:

- the mastery of territory,
- the production and use of building materials, and
- the administration of cities and living conditions.

The Romans developed highly sophisticated techniques, such as territorial surveying, division, and mapping. They used these to master the rural and urban land incorporated into the empire. They developed quality standards, measurement methods, and tools. They employed sophisticated customer-supplier relationships to increase production. The execution of large construction projects required effective working relationships among the various parties as well as effective processes for producing the individual buildings and other structures. The administration of urban life and living conditions involved the balancing of needs for urban administration with requirements of the social hierarchy. In doing so, political considerations often dominated juridical considerations. Thus, aims common to the individual building yards or to the development of a particular technique were influenced by the wider context.

The distinctive layout of Roman cities and the way in which rural lands were organized can still be seen today. This layout arose from the military encampments, the Roman castra, on which many cities were founded, in the

historic centres of many Italian cities, and in the layout of rural lands. The distinctive form of the castrum, with its regular grid of orthogonal roads, is also recognizable in cities outside Italy, like Timgad in Algeria.

This division of the land into regular and, in many cases, square blocks, was dictated by the requirements of Roman social organization. First of all, this system permitted a rapid overall view and therefore control by a hierarchical organization, even when the various offices were held on a rotational basis, by people from different places.

The system also facilitated apportionment of land by a central power into private lots and public urban areas, with a view to the subsequent infrastructure construction and property census operations. To support those census operations, accurate surveying enabled the monetary value of the lots to be easily calculated in terms of a uniform unit adopted throughout the empire.

In this way, the Romans managed to institute centralized control both on a local level and in relation to the capital.

Pompeii provides a particularly clear example of the way urban growth was regulated. The Romans developed this in the form of an isotropic small-square grid, with a system of roads marking off the lots and designed to accommodate the curving slope of the land.

The reorganization of Pompeii's civil forum during the second century B.C. provides clear evidence of urban planning. The outline of the great square was deliberately, though not precisely, aligned with the surrounding insulae. The addition of retaining walls and overlaps to the tuff colonnade gave a uniform appearance to the square. This operation indicates a conception of urban space as an ordered space, which hides the city's historical stratification: the slow process by which the city is formed.

The quality management features that led to the high quality and long useful lives of the renowned Roman roads included:

- planning and building by skilled engineers;
- the use of accurate measurement and standardized sign posting along the route; and
- a continuous flow of data on the condition of the roads (as well as the flow of information on conditions throughout the empire, which was the main purpose for the extensive road system). The information was provided by travelers, most of whom were state officials and therefore in contact with the road administration. Of course, these roads also carried information out to the empire's hinterlands. They carried out Roman urban planning and construction techniques used to remodel the newly conquered lands and cities. These techniques became increasingly specialized and refined, in terms of materials, engineering procedures, and juridical procedures. Over time, the roads served the needs of the constantly expanding empire spawned by the metropolis for which they had originally been developed.

Responsibility was organized hierarchically: each person was accountable to his immediate superior and any penalties imposed by the state were applied only to the contractors. In short, management for quality in this case was based on a distribution of responsibility established by contractual regulations and on the planning and supervisory functions performed by the architect.

One of the most important elements of quality management in the general organization of building was the coordination of the production functions (temporary works/structural normalization/evaluation of materials/stress optimization) performed on the work site by the various categories of craftsmen under the centre for exchanging and comparing ideas and for continuous training.

The building yard was the place where the Romans' achievements in design, materials, process, and standardization came together.

### 2.1.1 *Cities and urban quality*

The population of imperial Rome must have been more than a half million. The composition of the urban social classes reflected deep divisions in terms of well-being and prosperity (and therefore power)(Marco<sup>32</sup> 1984).

The authorities were organized into various state departments, who managed the city on the basis of building laws and regulations. Their main objectives were:

- to keep private property in the hands of the ruling class;
- to restructure urban areas that were becoming crowded and therefore losing their economic and representative value;
- to safeguard the public interest with respect to general services;
- to build intensively in order to provide housing for rental to the lower classes; and simultaneously,
- to maintain a minimum housing standard in terms of hygienic and urban life.

The hierarchical social system was constantly obliged to subjugate new populations for two reasons:

- first, to fuel an economy whose principal source of labour was slaves and freedmen and whose material resources were depleted by the huge growth of the central system itself; and
- second, to satisfy the market demand – particularly evident during the imperial period – for precious materials and exotic goods.

The main purpose was to regulate the use of urban space in relation to the quality of urban life. It was a solution dictated by considerations of hygiene and stability, designed to prevent overcrowding, to facilitate the distribution of services and maintenance, and perhaps, an attempt to limit building speculation with regard to the lower classes.

The development of standards in a variety of areas provided an important foundation for many of the Romans' achievements in managing for quality. Among the areas of standardization are units of measurement, sizes and shapes of building materials, structures and techniques used in construction, and building regulations that provided a form of housing standards.

The organization of management for quality in Roman architecture and urban planning described, was valid as long as the political and socio-economic system was capable of performing all these tasks organically. That is, as long as everyone shared the same basic objectives.

With the loss of the power of the Roman Empire, the organization of managing for quality had changed.

## **2.2 Germany**

The nineteenth century witnessed a broad movement to mass produce the goods needed to serve a growing affluence among consumers and the associated growing middle class. Technological innovation flourished and achieved acceptance among all industrial nations. As this movement progressed, the problem of quality assurance in mass production emerged as a major difficulty.

The revolutionary nature of mass production required adoption of methodologies beyond those employed by craftsmen. These new methodologies in effect consisted of three revolutions – revolutions in technology, in business management, and in statistics.

The advent of mass production intensified the problems of standardization and interchangeability. Clients and retailers in all sectors increasingly complained about the number of competing products that differed in size by minimal amounts. Such small differences were obstacles to interchangeability

but producers resisted standardization for fear of losing market share. The experience of World War I forced Germany to change its negative attitude.

The revolution in technology completely changed the work environment as factories utilized many automated machines and controls and only a few unskilled workers. There was less and less demand for unskilled or semi-skilled workers but the demand for technologically skilled workers grew (Lerner<sup>33</sup> 1984).

A major by-product of technological changes such as the assembly line was a decline in quality of work life. Most workers resented the monotony of performing short-cycle tasks over and over again. The managers deplored this but accepted it as necessary evil. Nevertheless, as education levels rose during the twentieth century, the workers in such jobs became a major underemployed asset. The companies were employing the physical bodies of the workers, but not their education or creativity.

In due course progressive companies responded by changing the organization of the workplace and the allocation of responsibilities. These changes took multiple forms. Some workers were assigned multiple functions relating to the same production task, which required them to carry out planning and coordination. Some workers were organized into teams which became largely self-directing through being given responsibility for many functions previously assigned to supervisors and technical specialists. These and other efforts to improve quality of work life will no doubt continue into the next century.

Throughout many centuries a central feature of German quality assurance has been the mark. A mark, whether stamped into the product or attached as a seal, could serve multiple purposes: to provide information about the product; to identify the producer, whether a craftsman, a factory, or a merchant; to identify the town or origin; and so on. It could also provide assurance that the product was of high quality.

## 2.3 Russia

Many elements of quality management system and examples of high-quality products are identifiable in early Russian history. The earliest and most important vital factor in establishing quality standards arose from the commitment of individual craftsmen. High levels of craftsmanship and a commitment to quality are demonstrated in a number of household products surviving from ancient times i.e. jewelry, ironware and wooden items.

Quality of finished goods results from a combination of many factors:

- quality of raw materials;
- manufacturing techniques;
- process control;
- motivation of workers;
- level of individual craftsmanship;
- commitment of top management, etc.

Peasants in Russia produced by hand clothes and utensils that looked plain but were remarkably durable. Each finished product was crafted by one person from beginning to end, and that person looked after its quality. IN most cases, no written records exist of production procedures (Melentev<sup>34</sup> 1984). They must have been handed down from one generation to the next. Children were trained in various crafts at home, and quality resulted from a caring attitude to work and pride of workmanship. This tendency seems to have continued until the start of mass production.

Prizes and awards for quality were established in Russia in the nineteenth century (Melentev<sup>34</sup> 1984). The highest form of recognition being the permission the use or display the state coat of arms on products. These prizes encouraged continuing improvements in design and production quality and provided valuable recognition for successful firms.



## 2.4 Britain

### 2.4.1 *The Hallmarking concept*

The concept of hallmarking as it is known today was introduced by an act of parliament in the year 1300 in the reign of Edward I. To this day, the British hallmark is still an important form of consumer protection and is accepted as a symbol of integrity all over the world.

### 2.4.2 *The dawn of innovation and modern product quality*

The Industrial Revolution was cradled in Britain, beginning around 1750.

There followed a period of such explosive growth that the future of every man, woman and child could be said to have been forged in the glowing furnaces and steelworks that lit the night skies in the heart-lands of Britain. The roots of modern managing for quality were also forged at that time; with rare exceptions there was a lack of agreed standards as we know them today.

### 2.4.3 *The growth of industrial standards*

Prior to the year 1900 there had been no coordinated attempts to speak of to establish any form of national standards organization.

Consequently, in 1901 an Engineering Standards Committee was set up by the Institution of Civil Engineers and other professional bodies. This later became the British Engineering Standards Association. A royal charter was granted in 1929 and a supplemental charter in 1931 when the present name, British Standards Institution<sup>35</sup> (BSI), was adopted. In its publication PD 4845, 1977 it says:

*The British Standards Institution is an independent body and its objectives are set out in the Royal Charter as follows:*

- a) to co-ordinate the efforts of producers and users for the improvement, standardization and simplification of engineering and industrial materials so as to simplify production and distribution, and to eliminate the national waste of time and material involved in the*

*production of unnecessary variety of patterns and sizes of articles for one and the same purpose.*

- b) To set up standards of quality and dimensions, and prepare and promote the general adoption of British standard specifications and schedules in connection herewith and from time to time to revise, alter and amend such specifications and schedules as experience and circumstances may require.*
- c) To register, in the name of the Institution, marks of all descriptions, and to prove and affix or license the affixing of such marks or other proof, letter, name, description or device.*
- d) To take such action as may appear desirable or necessary to protect the objects or interests of the Institution.*

In recent years, the BSI has pursued a policy of continually bringing its standards into line with international standards as agreed with the International Standards Organization (ISO).

## **2.5 Japan**

Japan has a long history of involvement with quality. Over the centuries, its craftsmen achieved high levels of quality in products such as paper, silks and swords.

In the military arena, Japan's weaponry proved to be quite competitive in the early stages of World War II. In contrast, its civilian goods produced for export were often of such poor quality that Japan acquired a reputation as a producer of inferior quality goods (Nonaka<sup>36</sup> 1984).

The defeat during World War II was a severe shock to all aspects of Japanese life and it took years for the nation to recover. They lost their major customers for military weapons and were faced with converting to civilian products.

Initially, designs were copied from others and through learning and improvements, the end product was marketed. However, they were still faced

with the stigma or reputation of poor quality. The challenge was to change that reputation by learning how to achieve high quality.

The Japanese adopted the concept of improving quality at a revolutionary rate, year after year. Major quality problems were solved by teams of managers and engineers. The much greater number of minor problems were solved by teams of workers – the QC circles. In addition, as the universities began to graduate large numbers of engineers, the companies shifted away from copying the designs of competitors and undertook product innovation. Probably the most important point was to encourage quality improvement through use of the managerial tools for quality and the need of the managerial tools, requiring the understanding and cooperation of top and middle management.

Two people, both quality gurus in their own rights, were instrumental in promoting this revolutionary turnaround in the Japanese way of thinking. The two people in question were Deming (statistical quality control) and Juran (managing for quality). It is important to emphasize that the content of Juran's lectures differed from that of the lectures given by Deming. In particular, it should be remembered that while Deming's field was statistics, Juran's field was management. Probably the most important points of the lectures were to encourage quality improvement through the use of managerial tools for quality and the need for understanding and co-operation of top and middle management (Juran<sup>37</sup> 1964)

To make these and other changes required unprecedented actions. Japanese senior managers personally became the leaders of the quality revolution. Managers at all levels received training in managing for quality. Company business plans were enlarged to include goals for quality.

The Japanese quality revolution was remarkably successful. Japan became the world quality leader in many product lines. The huge numbers of improvements greatly reduced costs in business processes as well as in manufacturing processes. The need for product inspection was greatly

reduced. Japan became an economic superpower, and the major reason was its quality revolution. The mark “Made in Japan” became a symbol of world-class quality.

The growth in export of Japanese goods forced other countries to take defensive action. The most heavily impacted was the United States, which lost large shares of market and thereby “exported” huge numbers of jobs to Japan. Gradually the impacted countries began to close the quality gap, but not before all quality levels had been raised as a result of the Japanese quality revolution

Quality control at last started to be used as a management tool. This marked the beginning of a gradual transition from statistical quality control to total quality control, and in turn led to the promotion of quality control in which all departments and all employees participated – in other words, total or company wide quality control....

Juran delivered his lectures in both Japan and the United States, why was the reception so different, and why did the Japanese become their star pupils?

The first reason is the early understanding of the necessity of quality control by top Japanese executives. For postwar Japan, quality improvement became a number one priority, and top executives gave their attention to changing the image of Japanese goods as being cheap and shoddy. In this connection Juran has stated: “...the unsung heroes of the Japanese quality revolution were the Japanese managers.” (Juran<sup>37</sup> 1964)

A second reason is the role played by educational organizations. These were the organizations that invited Deming and Juran, provided the audiences of top and middle managers beforehand, and followed up with appropriate courses afterward.

Finally, the Japanese supervisors and shop workers who listened avidly to seminars on quality control and who later formed quality circles deserve credit.

There followed a period of experimentation that included test applications of Japanese-style quality circles. These circles comprise small groups of workers who perform similar tasks in the same workshop. On a voluntary basis they are trained in the use of problem-solving tools, and are allocated time, usually one hour or so per week, to study problems in their work and to present solutions to their manager. The foreman or supervisor is normally the leader of the group. In the early 1980's the concept was very popular. However, the circles soon began to disappear and it was realized that the social problems of the workplace could not be solved simply by introducing a different concept of work organization; it was necessary to re-examine the nature of the whole work environment. In most cases this would involve a major change in the thinking and attitudes of the managers themselves.

One element present in all successes, and absent in most failures, was the personal involvement of the top management. In effect, the top management took charge of quality by accepting responsibility for certain roles.

## **2.6 Quality Initiatives – post 1980s**

### **2.6.1 *Customer focus***

The concept of meeting customer needs is ancient, but customer focus is a recent term. The new emphasis is traceable to the increased competition in quality. In addition, there have been some major changes in the meaning of the word customer.

All role models adopted the concept that the customer has the last word on quality. Adoption of this concept then led to intensified action to identify: who are the customers, internal as well as external; what are the needs of customers; what product features are required to meet those needs; how do customers decide which of the competing products to buy; and so on.

The concept of customer focus led to broader acceptance of the concept of participation – internal customers should participate in those planning activities that will impact their operations.

In addition, the public is an important category of customer. This has been emphasized by the growing concern over safety, health, the environment, and consumer protection.

The term customer focus has been widely accepted by managers as a key guiding principle.

### *2.6.2 Training for Quality*

During the 1970s there emerged the quality crisis resulting from the Japanese quality revolution. It became clear that training should not be limited to the quality department – it should be extended to all functions and to all levels of the hierarchy.

It also became clear that training should not be limited to exhortation and statistics – it should be expanded to include managing for quality. At the time, training courses in managing for quality were still in the early stages of evolution.

By the 1990s, numerous designs had become available for training in managing for quality. One was based on the criteria for the Malcolm Baldrige National Quality Award. Another was based on Deming's lectures – statistical quality control plus his 14 points (Deming<sup>11</sup> 1986). A third was based on the Juran Trilogy which organizes the subject matter into three fundamental processes:

- Quality planning
- Quality control and
- Quality improvement (Juran<sup>12</sup> 1986)

### *2.6.3 Total Quality Management (TQM)*

By the 1980s it was becoming clear to top management that quality leadership could not be achieved by tinkering – by bringing in this or that tool or technique. Instead, it was necessary to apply the entire array of quality know-how throughout the entire company – to all functions and all levels – and to do so in a coordinated way. One shorthand expression for this comprehensive approach is the term TQM (Japanese term is company-wide quality control).

At the outset there was no agreed standard definition for TQM, so communication became confused – among company departments, in their training courses, and in the general literature. This confusion has since been reduced by the publication of the criteria used by the American National Institute for Standards and Technology (NIST) to judge the applications for the United States' Malcolm Baldrige National Quality Award (Baldrige Award).

As the quality crisis deepened during the last half of the twentieth century, more and more prerequisites were identified as essential to achieving world-class quality. A need then arose for a short label for this list of prerequisites. As of the 1990s, the most popular label was the term total quality management or TQM.

It has now become evident that attaining quality leadership requires that top management personally take charge of the quality initiative. They did not just make the speeches and then delegate all else to subordinates. Instead, they personally carried out certain non-delegable roles.

There's much to be learnt from some of the European countries, however the developments that have taken place or have been taken place in Europe may not always be applicable in South Africa, as our socio-economic environment is significantly different from that of Europe.

It is clear that during its long history, managing for quality has consisted of long periods of relative stability punctuated by short periods of turbulent

change. One such period of turbulent change is of recent origin, it began with the Japanese quality revolution of the last several decades. This change has demanded that organizations undertake revolutionary rates of quality improvement in order to remain competitive. To date, this response has become effective only in a relatively small proportion of the world's institutions. There is an interest in parallel here. About a century ago there emerged a massive movement that came to be known as scientific management. Its major focus was on improving productivity and its influence was felt throughout the 20<sup>th</sup> century.

The world is now in the early stages of a massive movement, this time in managing for quality. It began late in the twentieth century but still has far to go before becoming widely effective in world economies. The likelihood is that it will require the entire 21<sup>st</sup> century to digest this change. As a result, the 21<sup>st</sup> century may well become known to historians as the century of quality.



# CHAPTER 3

## ISO 9000 + ISO 14000 SERIES

### 3.1 Introduction

Customers and global competitiveness are changing the way organizations around the world are doing business. Quality is leading that change, providing quality products and services to keep your customers coming back. However, quality doesn't happen just because you talk about it.

To achieve quality, one must work at it by understanding your processes – the work you do every day – and continually improving them.

Standardizing your work into an organized and documented system can provide the foundation for a comprehensive quality management programme, ISO 9000 standards are helping organizations do just that.

If business ventures are to be profitable, a company must consider the quality of its products and/or services. In meeting continued challenges from its competitors in any field, a company must offer products and/or services that:

- Meet a well-defined need, use or purpose
- Satisfy customer expectations
- Comply with applicable standards and specifications
- Comply with requirements of society
- Reflect environmental needs
- Are made available at competitive prices
- Are provided economically

Requirements of society: obligations resulting from laws, regulations, rules, codes, statutes and other considerations. "Other considerations" include

protection of the environment, health, safety, security, conservation of energy and natural resources.

In order to meet its objectives, an organization should ensure that the technical, administrative and human factors affecting the quality of its products are under control, whether hardware, software, processed materials or services. All such controls should be oriented towards the reduction, elimination and, most importantly, prevention of quality non-conformities.

A quality system should be developed and implemented for the purpose of accomplishing the objectives set out in the organization's quality policy. Such a system must be assessed periodically to ensure its continued suitability and effectiveness.

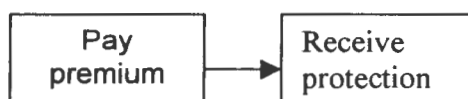
## 3.2 Definitions and terms

### 3.2.1 *Quality Assurance*

All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. This covers all the actions necessary to provide adequate confidence that a product or facility will perform satisfactorily in service, or that all the user requirements are adequately satisfied.

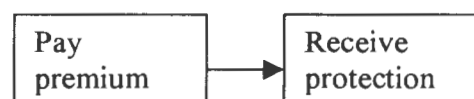
The term "quality assurance" can be more readily understood when it is compared with the term "insurance"

#### INSURANCE



"Protection" = compensation after disaster

#### QUALITY ASSURANCE



"Protection" = early warning before disaster

Both insurance and quality assurance involve paying something for protection against disaster. In the case of insurance, the protection consists of repayment after the disaster. In the case of quality assurance, the protection consists of early warning before the disaster.

There are both internal and external purposes for quality assurance:

- a) Internal quality assurance: within an organization, quality assurance provides confidence to the management;
- b) External quality assurance: in contractual or other situations, quality assurance provides confidence to the customers or others.

Unless requirements for quality fully reflect the needs of the user, quality assurance may not provide adequate confidence.

### *3.2.2 Quality System*

Organizational structure, procedures, processes and resources needed to implement quality management. The quality system should be as comprehensive as needed to meet the quality objectives.

The quality system of an organization is designed primarily to satisfy the internal managerial needs of the organization. It is broader than the requirements of a particular customer, who evaluates only the relevant part of the quality system.

### *3.2.3 Quality Manual*

Document stating the quality policy and describing the quality system of an organization.

A quality manual may relate to the totality of an organization's activities or only to a part of it. The title and scope of the manual reflects the field of application.

A quality manual will normally contain or refer to, as a minimum:

- a) Quality policy

- b) The responsibilities, authorities and inter-relationships of personnel who manage, perform, verify or review work affecting quality;
- c) The quality system procedures and instructions;
- d) A statement reviewing, updating and controlling the manual.

A quality manual can vary in depth and format to suit the needs of an organization.

#### *3.2.4 Quality Policy*

Overall intentions and direction of an organization with regard to quality, as formally expressed by top management. The quality policy forms one element of the corporate policy and is authorized by top management.

#### *3.2.5 Quality Management*

All activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system.

#### *3.2.6 Corrective Action*

Action taken to eliminate the cause of an existing non-conformity, defect or other undesirable situation in order to prevent recurrence.

The corrective actions may involve changes, such as in procedures and systems, to achieve quality improvement at any stage of the quality loop.

#### *3.2.7 Total Quality Management*

Management approach of an organization, centred on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society.

The expression “all its members” signifies personnel in all departments and at all levels of the organizational structure.

The strong and persistent leadership of top management and the education and training of all members of the organization are essential for the success of this approach.

In total quality management, the concept of quality relates to the achievement of all management objectives.

The concept “benefits to society” implies, as needed, fulfillment of the requirements of society.

Total Quality Management (TQM) or parts of it are sometimes called “total quality”, Company-wide quality control (CWQC), Total Quality Control (TQC) and so on.

### **3.3 ISO 9000**

The ISO 9000 series, which has gained international recognition and acceptance, is a set of standards, some of which specify requirements for quality systems (ISO 9001, ISO 9002 and ISO 9003), and others which provide guidance to aid in the interpretation and implementation of the quality system (e.g. ISO 9000-2, ISO 9004-1)

ISO 9001<sup>38</sup>, *Quality systems – Model for quality assurance in design, development, production, installation and servicing* – sets out the requirements to be met where a business is involved in design and development, production, installation and servicing.

ISO 9002<sup>39</sup>, *Quality systems – Model for quality assurance in production, installation and servicing* – give the equivalent requirements where a business does not undertake design and development.

ISO 9003<sup>40</sup>, *Quality systems – Model for quality assurance in final inspection and test* – is the equivalent model where design control, process control, purchasing or servicing are not required and basically inspection and testing are used to ensure that final products and services meet specified requirements.

ISO 9001 is not “higher” in level than either ISO 9002 or ISO 9003. For each small business, one of the three standards will be the most appropriate. The standard selected should be that one best suits the operations undertaken within the organization.

If the organization is providing a service, as with a Local Authority, ISO 9004-2<sup>41</sup>, *Quality management and quality system elements – Part 2: Guidelines for services*, is a worthwhile reference.

It must be emphasized that the quality system requirements specified in this International Standard, ISO 9002 and ISO 9003 are complementary (not alternatives) to the technical (product) specified requirements. They specify requirements that determine what elements quality systems have to encompass, but it is not the purpose of these International Standards to enforce uniformity of quality systems. They are generic and independent of any specific industry or economic sector. The design and implementation of a quality system will be influenced by the varying needs of an organization, its particular objectives, the products and services supplied, and the processes and specific practices employed.

### **3.4 Quality Concepts**

The word “quality” means different things to different customers, however it can be summed up in three different ways:

Appearance – which covers those aspects of the product that appeal to the individuals ideas about the visual appearance, the touch, shape or smell of the product.

Function – which is the task the product performs or achieves and how well it performs that task.

Cost – which covers the amount of money a customer is prepared to pay for the product.

#### *3.4.1 Quality as defined in the Standards*

The American National Standards Institute (ANSI) defines quality as “the features and characteristics of a product that relate to the ability of that product or service to satisfy given needs”.

The British Standards Institute (BSI) sees quality as “the totality of features and characteristics of a product or service that bear on its ability to satisfy a given need”.

In SABS 0158: 1987<sup>42</sup>, quality is defined as “the totality of features and characteristics of a product that bear on its ability to satisfy stated or implied needs”.

As can be seen, the word “need” appears in all three definitions. It is essential that the product or service satisfy the needs of the customer. The level at which the customer believes his needs are satisfied by the products or service offered to him, will determine how he evaluates the quality of the products or services – the more he believes his needs to be satisfied, the higher he will believe the quality level of those products or services to be.

#### *3.4.2 Quality Management*

Organizations – industrial, commercial or governmental – supply products/services intended to satisfy customers’ needs and requirements. Increased global competition has led to increasingly more stringent customer expectations with regard to quality. To be competitive and to maintain good economic performance, organizations/suppliers need to employ increasingly effective and efficient systems. Such systems should result in continual improvements in quality and increased satisfaction of the organization’s

customers and other stakeholders (employees, owners, sub-suppliers, society).

Customer requirements often are incorporated in “specifications”. However, specifications may not in themselves guarantee that a customer’s requirements will be met consistently, if there are any deficiencies in the organizational system to supply and support the product. Consequently, these concerns have led to the development of quality system standards and guidelines that complement relevant product requirements given the technical specifications. The International Standards in the ISO 9000 family are intended to provide a generic core of quality system standards applicable to a broad range of industry and economic sectors.

The management system of an organization is influenced by the objectives of the organization, by its products and by the practices specific to the organization and, therefore, quality systems also vary from one organization to another. A major purpose of quality management is to improve the systems and processes so that continual improvement of quality can be achieved.

The International Standards in the ISO 9000 family describe what elements quality systems should encompass, but not how a specific organization implements these elements as needs of any organization vary. The design and implementation of a quality system must necessarily be influenced by the particular objectives, products and processes, and specific practices of the organization.

Quality management is all the activities of the overall management function that determine the quality policy, objectives and responsibilities, and implementation is by means of the quality system. Quality management is thus managing with the ideal of achieving quality.



### 3.4.2.1 Objective of quality management

The quality management objectives are to ensure that the product or service:

- Satisfies the customer's needs and expectations;
- Is at a price acceptable to the customer and to the supplier; and
- Can be achieved in time to meet delivery requirements.

It may at first perhaps be surprising to find that the objective is not to produce as high a quality as possible, but merely to satisfy the customer. This is all that is required and indeed it is undesirable to produce a higher quality than is necessary, if as a result, the selling price has to be increased or deliveries delayed. If the grade of quality is high and the cost is low, we get good value for our money.

$$\text{Value} = \frac{\text{Quality grade}}{\text{Cost}}$$

### 3.4.3 Operation of a quality system

The quality of products/services depends on how the company is managed and what sort of control is exercised over all the activities concerned in the design, manufacture, inspection and other activities which affect quality.

Companies should use a system to achieve control of quality. Such a system is identified in most countries by the term "quality system". A quality system consists of a group or a list of guidelines and disciplines that together are aimed at gaining satisfactory quality levels in products/services. It is the documenting of experiences, well tried over preceding years, and is also a valuable tool in the search for improved performance i.e. greater efficiency through more efficient production, less wastage and better customer satisfaction.

A successful, cost-effective quality system is one in which –

- a) Quality policies and objectives are well defined;
- b) All persons are motivated as regards the achievement of quality, from the top down and from the bottom up;

- c) Responsibilities are clearly given for each person of the company whose activity affects quality;
- d) Communication in the company is good and will result in everybody working together to achieve quality by analyzing failures and then carrying out cost-effective corrective action;
- e) Instructions provided to all are clear, simple and available when required;
- f) Meaningful records are kept that demonstrate the achievement of the desired quality and highlight any quality problems and bring about corrective action in respect of either the product/service or the quality system, to solve these problems;
- g) Training is available at all levels and is ongoing; and
- h) The system and product are regularly monitored and the performance reported as a basis for improvement.

The successful implementation of the above establishes control within the company, which is important for the successful operation of any quality system if acceptable product/service quality levels are to be achieved.

#### *3.4.4 Quality Improvement*

The SABS ISO 9000 series requires continual improvement of the Quality Management System. The organization's goal must be towards continuous improvement of its products and services for its external customers. No part of the SABS ISO 9000 series can guarantee that end.

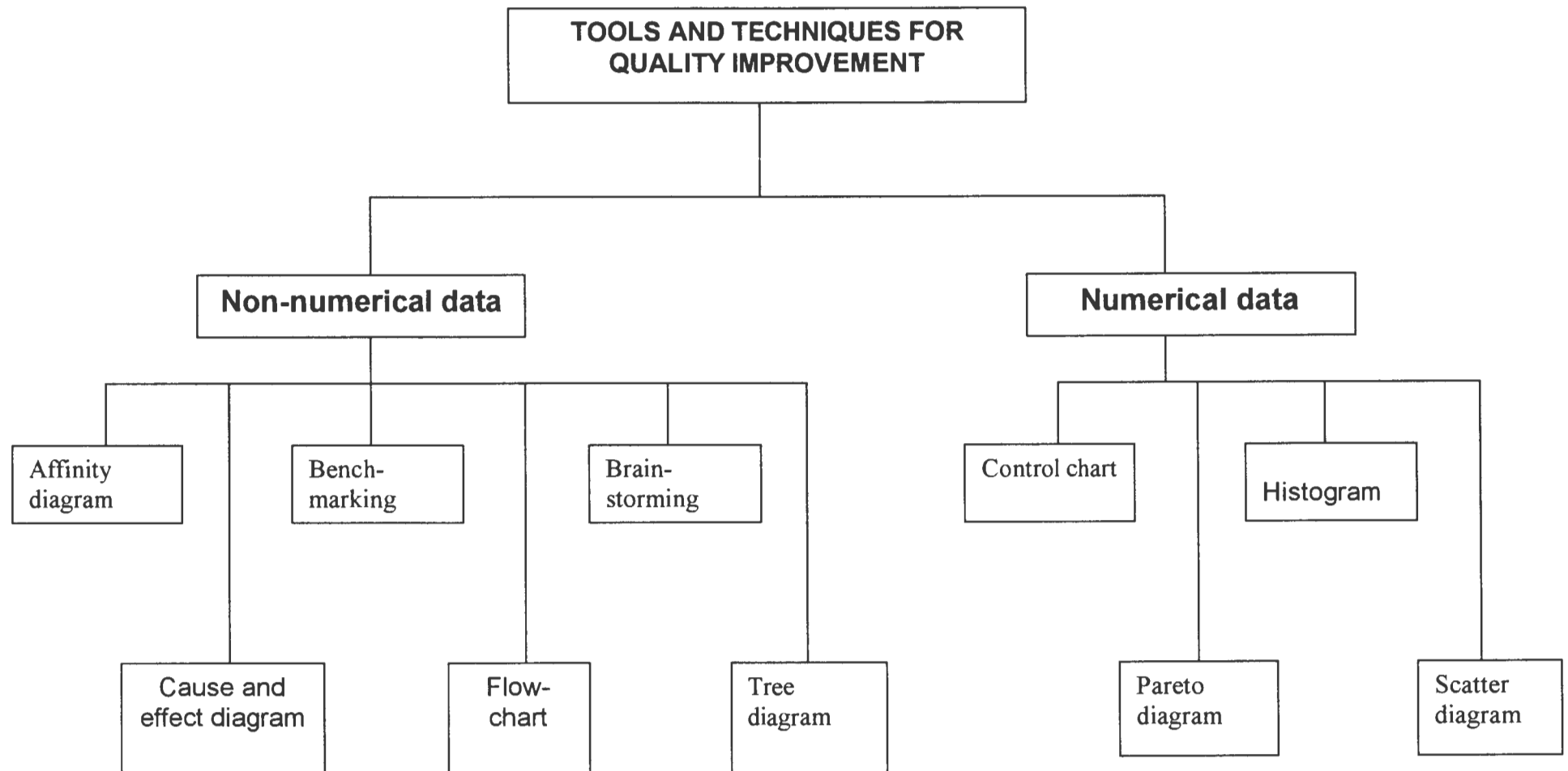
SABS ISO 9000 is but a step along the way i.e. a basis for improvement.

ISO 9000 is the world standard, but is only the first concrete step on a never-ending journey towards continuous improvement. It is therefore important that organizations seek ISO 9000 accreditation for the right reasons but more importantly they must be related to the staff through training in ISO 9000 so that all levels buy into the implementation of the system and in turn lend it their full support. This issue is critical for the ongoing success of the Quality System.

Completion is being defined by the services offered. Recent studies in America and Europe have shown that only 40% of the decision to buy a product is based on the product, the other 60% are the services being offered.

The SABS ISO 9000 series require the following:

- The establishment of a documented quality system;
- The preparation of a quality manual which covers the requirements of the applicable standard;
- The inclusion or reference of documented quality system procedures; and,
- The outline of the structure of the quality system documentation.



### 3.5 ISO 14000

*ISO 14000 embodies a new approach to environmental protection. In contrast to the prevailing command-and-control model, it challenges each organization to take stock of its environmental aspects, establish its own objectives and targets, commit itself to effective and reliable processes and continual improvement, and bring all employees and managers into a system of shared and enlightened awareness and personal responsibility for the environmental performance of the organization. This new paradigm relies on positive motivation and the desire to do the right thing, rather than on punishment of errors. Over the long term, it promises to establish a solid base for reliable, consistent management of environmental obligations. (Joseph Cascio<sup>47</sup>, 1996)*

In a nutshell, the extract above embodies what the ISO 14000 series sets out to do. The intention behind the ISO 14000 standards is to lay out tools and systems for the management of numerous environmental obligations as well as the conduct of product evaluations, without prescribing what goals an organization must achieve. In other words, this series aims to provide guidance for developing a comprehensive approach to environmental management.

The ISO standards, in their entirety, cover a wide range of subjects. These include environmental management, environmental auditing, life cycle assessment, environmental labeling, environmental performance, and others. Because of this wide breadth of coverage, confusion can exist but an organization only need to show conformance to the Environmental Management System (EMS) document – ISO14001<sup>43</sup>.

Environmental degradation and particularly ozone depletion became a big concern worldwide resulting in the banning of ozone-depletion chemicals after a meeting of representative countries in Montreal during 1987. It was also realized that there was an absence of a universal indicator to assess an

organization's good-faith effort to achieve reliable and consistent environmental protection – the eventual ISO 14001 standard.

At the same time the ISO 9000 quality management drive was achieving great success and it was envisaged that similar success could be derived from an environmental management system. The actual trigger came in 1991 when the United Nations announced its Conference on Environment and Development (UNCED) in June 1992 to be held in Rio de Janeiro. Strategic Advisory Group on the Environment (SAGE) was established and was mandated to develop standards on environmental management.

### **3.6 Comparison of ISO 9000 and ISO 14000**

Both these standards share the goal of developing process rather than performance standards and additional efforts to harmonize structure, terminology and other elements to make these standards compatible.

There are however major differences between quality management and environmental management, for instance, quality standards affect the organization and its customers whereas environmental management has a greater reach and affect an organization's relationship to its neighbours, nearby creatures and ecologies and ultimately humankind. In addition, unlike the quality field, the environmental arena is burdened with a bitter history of confrontation, ideological battle lines and political exploitation. Those who fail to attain quality levels are not normally subject to civil and criminal sanctions, while those who transgress the environmental laws clearly are.

The ISO 9000 series have three documents classified as requirements documents since they lay down the requirements of the organization. They are:

- ISO 9001 – model for quality assurance in design/development, production, installation and servicing

- ISO 9002 – model for quality assurance in production and installation
- ISO 9003 – model for quality assurance in final inspection and test

In the ISO 14000 series, the equivalent to these three standards is ISO 14001 which is called the specification document, since it provides specification for an EMS.

In addition, both the ISO 9000 and the ISO 14000 series include a guidance document for developing and implementing their respective management systems. In the ISO 9000 series, the guidance document is ISO 9004, and in the ISO 14000 series, it is ISO 14004.

Some of the components of the ISO 14000 series have no parallel in the ISO 9000 standards. These include environmental labeling, life cycle assessment as well as the environmental performance evaluation guideline document.

Comparison of ISO 9000 and ISO 14000 (Cascio, Woodside, Mitchell, 1996)

	ISO 9000	ISO 14000
Aims	Provides to supplier organizations a means for demonstrating to customer organizations the achievement of requirements for quality; enhances the achievement of a supplier organization in providing overall performance in relation to objectives for quality	Provides organizations with the elements of an environmental management system; provides assistance to organizations considering the implementation or improvement of an environmental management system, including advice on enhancing such a system to meet environmental performance expectations
Structure	Mixture of management activities, process requirements and verification requirements; separate guidance standard	Adheres to "plan-do-check-act" type of business model; separate guidance standard
Contents	ISO 9001 includes discrete elements of quality planning, product identification and traceability, and statistical techniques	ISO 14001 includes discrete elements of environmental aspects, legal requirements, objectives and targets, environmental management programme, communications, and emergency preparedness and response
	Both ISO 9001 and ISO 14001 include the elements of management commitment and responsibility, management system documentation, document control, operational control, training, monitoring and measurement, nonconformance and corrective action, records and audits.	

One of the strongest aspects of the ISO 9000 management model is the requirement for sound, comprehensive, controlled documentation. This model, which requires documentation for all major elements of the quality system, is also included in the ISO 14000 standards. Records management, document control, documented procedures, and training records must all be part of the EMS.

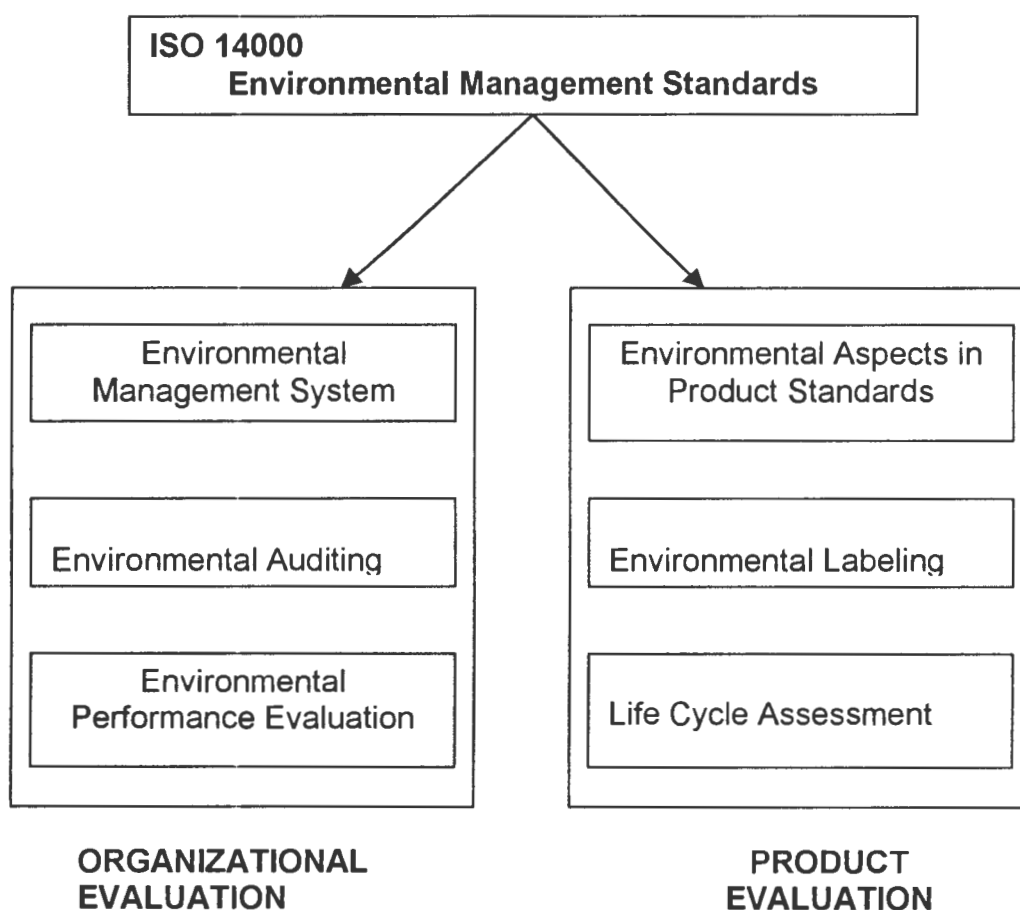
It is a major challenge to be sure that we create a standard that has as great a value to small countries that are developing, as to larger nations. – *Dorothy*



*Bowers*: Vice President, Environmental and Safety Policy and Chairman, Subcommittee 4 (Environmental Performance Evaluation) of TC 207

### 3.7 Elements of ISO 14001

The subjects covered under the ISO 14000 can be divided into two separate areas. The first deals with an organization's management and evaluation systems; the second, with environmental tools for product evaluation as shown in the figure below. Each is further subdivided into three sections i.e. organization evaluation consists of environmental management system, environmental auditing and environmental performance evaluation. Product evaluation consists of environmental aspects in product standards, environmental labeling and life cycle assessment.



ISO 14001<sup>43</sup>: *Environmental Management Systems – Specification with Guidance for Use*

This document is the most consequential in the ISO 14000 series. It lays out the elements of the environmental management system that organizations are to conform to – it is the management system specification document and is designed for those organizations that wish to declare their conformity to environmental standards.

The environmental management structure is “that part of the overall management system which includes organizational structure, planning, activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy” (Section 3.5, ISO 14001<sup>43</sup>).

The elements of the management system are portrayed in the figure below. As shown, they can be visualized as building blocks of a pyramid, with the core elements of management commitment and environmental policy forming the base for all other components of the EMS.

When viewed as a pyramidal structure, it is easy to see that elements in the lower tiers of the EMS are critical building blocks of the system and must be in place to support the elements mentioned.



**Environmental Management System Pyramid**

The requirement in ISO 14001 to build and operate an EMS focuses the organization's efforts on establishing reliable, affordable and consistent approaches to environmental protection that engage all employees in the enterprise. The environmental protection system becomes part of the total management system, receiving the same attention as quality, personnel, cost control, maintenance and production functions. Reliability is achieved through continual awareness and competence of all employees, rather than through extraordinary or isolated efforts of specialists. Thus, ISO 14001 has the potential to provide consistent environmental protection through better management, at an affordable price.

The implementation of environmental management systems will bring about gradual cultural change within organizations, and hopefully throughout the world (Cascio, Woodside, Mitchell, 1996)<sup>44</sup>. This is a reasonable expectation, since the standard requires increased awareness, education, training and

care from employees so that they understand and respond to the environmental consequences of their work. In addition, each employee is required to adhere to the environmental policy of the organization and to know how he or she can avoid or minimize environmental incidents. The involvement of all employees in the environmental management process promotes an environmentally conscious culture in the organization and, hopefully, in the lives of individuals too.

### **3.8 Conclusion**

In some developing countries, compliance options will be limited by deficiencies in both organizational resources and available infrastructure. Infrastructure plays a key role in compliance since it is difficult to be in regulatory compliance without the necessary infrastructure.

Conceivably, this situation may provide impetus for some countries to redraft their environmental laws so that they may match their existing resources and capabilities. Although redrafting laws to match resources and capabilities may weaken the legal framework in the short term, the overall effect is to increase the ability of the organization to comply with legal requirements. As the infrastructure improves, laws can be made progressively strict. The overall effect is to increase the credibility of all parties involved with environmental progress, including legislators, organizations, and enforcement authorities.

On the other hand, countries with an economy that is strong enough to provide an environmental infrastructure should opt to build this infrastructure to match requirements of their existing laws. Such a step could improve environmental performance immediately, and is obviously preferable to weakening existing laws.

Both standards i.e. ISO 9000 series and ISO 14000 series have a strong management focus particularly focussing on commitment from top management and involvement and participation of all employees. This culture

of thinking and development is what is needed for the continual improvement process.

ISO 9000 with its focus on quality systems is the forerunner on which ISO 14000 is based. The management systems required or those attempted by adopting either standard is the philosophy behind the Total Quality Management (TQM) concept in which continual improvement, service delivery and customer satisfaction are paramount outcomes.

# CHAPTER 4

## URBAN MANAGEMENT

### 4.1 Introduction

There has been a tendency lately for people to move to the city, increasing urbanization and its related problems. This “settlement” is prevalent in modern cities and the tendency is reserved for a small number of large cities globally due to the fact these “migrants” view the city as a political and economic centre. However, rapid urbanization has led to the decline in the services that the local government can provide.

The structure of the city is defined by its roles and responsibilities i.e. what it controls or by what it does (Abbott<sup>45</sup> 1996) and therefore the management of the city duplicates the system of line functional government resulting in a mechanistic approach to urban government.

There are three distinct approaches to urban management as highlighted by Abbott, each concentrating on a particular activity within the general concept of urban management - the first concentrating on public administration, the second approach being comparative and descriptive (Davey<sup>29</sup> 1992, Perleman<sup>46</sup> 1990) and the third seeks to define a form of theoretical framework (Kooiman<sup>47</sup> 1993).

Davidson and Nientied describes the essence of urban management as “taking an active role in developing, managing and coordinating resources to achieve a town’s development objectives” (Davidson and Nientied, 1991: 85)<sup>48</sup>. This statement is supported by Abbott in saying that the city embraces all functions and services and that service provision becomes the primary goal of urban management.

It is at this point that the introduction of TQM becomes evident as the quality philosophy focuses on efficient and effective service delivery.

The current sustainable cities approach to governance and the four element model that supports it (Abbott<sup>45</sup> 1996) i.e. community, resources, environment and local government places the participatory process at the centre of urban development. Emphasis is placed on maintaining a balance between resources, environment and community whilst focussing on the needs of the poor – the ultimate customers of the system. Similarly, TQM with its emphasis on customer satisfaction, service delivery and participation of all role players could help in obtaining these objectives.

Perleman speaks about the megacities project and categorizes this project into seven urban policy arenas i.e. income generation and employment; housing and land use; food and energy, water and sanitation; transportation and communication; education and training; and public health and safety (Perleman<sup>46</sup> 1990). This chapter examines some of these aspects under different headings but where quality management is applicable and how through the implementation of the total quality management philosophy, the city can improve its image, efficiency, effectiveness and service provision.

## **4.2 Government**

### *4.2.1 Governance*

Throughout the nation there is a sense of unease about the capacities of local governments to meet the challenges of old demands and rising expectations.

The idea of grouping various operating agencies involved in similar or related activities was admirable, but city officials did not develop an adequate implementation strategy (Hawley<sup>28</sup> 1974). Specifically, they did not always decide what tradeoffs and incentives might make previously separate agencies want to collaborate, nor did they consistently develop any coherent programme directions around which such collaboration might take place. And

as far as can be determined, the unions and community groups were not made part of the planning or later implementation, and yet the involvement of these key participants was essential.

The diagnosis that these strategies was based on suggests that a major source of city governments' poor performance was their lack of management capability, especially in goal-setting, program-planning, auditing, evaluation, and the like.

As has by now been documented so well, this crisis is a result of numerous forces, many well outside the control of cities, such as rapid and unplanned urbanization, industrialization, technological change, and outdated political boundaries. (Rondinelli<sup>27</sup> 1990, World Bank<sup>26</sup> 1991, Davey<sup>29</sup> 1992). The following specific changes are of particular importance:

- advances in transportation technology, leading to speeding the exodus of industry and the white middle class from the increasingly poor central cities to suburbs;
- the automation of production, reducing certain types of employment opportunities for less-well-educated;
- the development of mass media that spread information nationally about affluence, riots, and inequality, thereby heightening frustrations and raising aspirations among the poor minorities, while increasing the anxiety of all city residents.

It would be quite wrong to trace the burden for the social problems to failures in urban management. And it would be foolish to imply that these difficulties can be eliminated through more effective strategies and techniques for delivering public services. It is generally true that the machinery of city governments has been inadequate and inflexible in the face of these new and continuing challenges.



Too few city governments have had the managerial capability to plan, set goals, develop cost-effective programs, monitor and evaluate them, develop control systems that permitted a constant appraisal of employee performance and accountability, and become more responsive to changing client needs. In many cases, city management has become extreme examples of static, traditional bureaucracies. Moreover, agencies responsible for urban problem-solving are increasingly fragmented both from one another and internally, further hampering their capacity to adapt and to deliver services (Hawley<sup>28</sup> 1974).

A small part of the reason for this is because social scientists and urban managers are seldom comfortable with each other's priorities and perspectives. The former lack the capacity or interest to view problems from the perspectives of those experiencing them and responsible for their solution. Too often, researchers – academicians, in particular – shun the context of public policy and application as if social theories, models or behaviour, or methodologies can be justified or validated without testing them on “the real world” and examining their consequences. Public managers, for their part, too often have inadequate training or time to translate research findings into viable programs and plans for implementation and harbour the conviction that only those on the firing line can really understand the problems, much less provide “realistic” solutions.

While there is substantial agreement that the quality of urban life is less than it should or could be, there are markedly different diagnoses of the problems and consequent prescriptions of social change strategies.

Pouring resources into urban development programs may not help that much if the cities, and the public sector in general, do not have the management capability and delivery systems to use them effectively.

More generally, providing additional resources are much too simplistic, a strategy for improving the delivery of needed services in inner cities. In many instances, its main effect is to spread inefficiency.

Changed national priorities, more money for the cities, more and better programs, technology, and more managers might be important, but they will be hopelessly inadequate unless accompanied by major changes in the management and delivery systems of cities and in the politics that affect them. In a word, it is not enough for cities just to have new resources. They must be organized and disposed to use them well.

### **4.3 Economics**

The advantage the car affords, in terms of greater mobility, convenience and flexibility, provide undoubted benefits to many members of society but, at the same time, the rapid expansion in vehicle ownership has had serious repercussions on the urban economy.

#### ***4.3.1 Urban growth***

The greater mobility afforded by growth in car ownership has encouraged and enabled the development of urban sprawl and the expansion in suburban living which has been characteristic of urban change over the past several decades (Button<sup>49</sup> 1976). The radical change in urban structure has created a number of problems, not the least of which is the demands on urban transport itself.

The complexity of urban life proves an obstacle to the application of economic analysis. There is no satisfactory resource allocation model that can determine the optimal combination of factors of production in an urban economy – an economy which changes both over time and in space. Yet economic analysis can and must be applied to the many problems relating to urban land use. The location of economic activity, spatial structure and urban growth, land values and town planning, urban transport, the property market, the processes of development, the techniques of investment analysis, the issues of betterment and land nationalization, the economics of urban decay and renewal, the economics of housing, the condition and the role of the

construction industry – these and other areas provide the economist with the opportunity to apply his special powers of analysis and to investigate in specific contexts the productive and distributive processes of urbanized society.

There are four major forces determining the pace of urbanization throughout the world – economic growth and development, technological change, a rapid growth in the world population and a large-scale movement of people from rural areas to the cities (Button<sup>49</sup> 1976). Despite the current recession in most Western industrial countries, the world production of goods and services continually increases. As a result of improvements in transportation and the supply of power, production becomes more rather than less concentrated in those locations offering the greatest comparative advantages. These tend increasingly to be large urban market areas – smaller urban settlements declining in relative importance. This trend is compounded by the simultaneous growth of large, often multi-national, companies which with their increasing market dominance and internal and external economies of scale form an interdependent relationship with areas of large population and high purchasing power.

Activities make demands on human resources. It is this continual allocation of resources to activities which fuels the engine of change. The classical resource trinity comprises land, capital and manpower – its muscle, its skills, its intellectual capacity, its creativity (Balchin<sup>50</sup> 1985). In combination, these resources become committed in varying degrees to the pursuit of human activities. Land, air and water are put to use, human resources become engaged in production and consumption, capital is turned into structures, plant, vehicles and equipment. And by such processes changes in human activity are generated and sustained.

The relationships between resources and activities define three classes of change. The relationship between human resources and activities creates the differing combinations of opportunities which are available to different groups in the community. The relationship between capital and activities creates the

pattern and process of investment by which capital is allocated to different activities. The relationship between land and activities leads to changes in land use and development which together mould the physical environment.

#### *4.3.2 Public Administration*

All public administration is concerned with human activities, with what the community, individually and collectively, wants to do with its money, time, skills and energy. More specifically public administration is concerned with changes in human activities that should otherwise not be determined by market choice alone.

The task of public administration is essentially to control processes of societal change, both by itself promoting changes or by regulating changes initiated by others. For environmental change, responsibility for control is shared between central and subsidiary tiers of government, with the former defining through legal powers the context in which the latter operate, but with both levels exercising significant powers of controls over the activities of operators, developers and consumers. However, the leading role is that of the local authority. Even where situations arise which merit nationally or regionally consistent actions in response, the tendency in planning is for these responses to be administered by local government, acting partly as agent of central government for that purpose but also exercising local discretion in the precise application of the response. It is therefore the more local tier of authority which has the chief responsibility for controlling environmental change in the community, although at certain times, in certain places, in relation to certain kinds of change its locus as such may be limited or completely overridden by the exercise of authority by others.

The local authority's efforts to control change will represent interventions in the activities of developers, operators or consumers to influence the system of incentives and sanctions within which they operate. Justification for such interventions lie entirely within the workings of the community, for the sole purpose of intervention to establish relations and conditions more acceptable than the unimpeded working of the environment subsystem would itself

produce. The planning objectives of a local authority should relate directly to their perceptions of the problems, needs and desires of the community it administers. It cannot exist to serve its own ends.

The traditional methods of planning and managing urban activities have changed radically in the past decades since the inherent urban problems have become more apparent. The city is no longer treated as a piece of land with factories, shops, theatres, houses, parks and roads scattered randomly over it. The city has been recognized as a living organism with people living and moving within it. The realization of this human and social element has resulted in the growth of a whole new range of studies, including urban sociology, urban psychology and, of course, urban economics.

#### *4.3.3 Urban Economy*

It is impossible to study the urban economy in purely economic terms: full cognizance must be taken of the historical, political, sociological, planning and geographical perspectives of urban activities. The study of cities must, by virtue of the nature of urban agglomerations, be multi-disciplinary.

Cities form part of a much larger economic system; most cities play important roles in regional activities, while the largest can influence the course of the national economy. Consequently, many urban problems cannot be treated in isolation but must be placed in their much broader context.

Cities are becoming both larger and more numerous. For firms there are positive advantages to be enjoyed by locating together, either with firms of similar type or with those of a supplementary nature. Geographical concentration permits the benefits of agglomeration and scale economies to be reaped and transport costs to be minimized. To the individual, cities offer a wide range of social and recreational facilities and permit a higher standard of living to be enjoyed. There is clearly a link between attraction of cities to firms and individuals. The market and labour supply of a large urban area benefit firms locating there but the individuals also gain from having a wide range of jobs to choose from and the prospect of higher incomes. Whether it is the

availability of labour which attracts industry initially, or the opportunity of employment which attracts workers, is something of a "chicken-and-egg" relationship, but in all probability it is a simultaneous process with almost instantaneous adjustment between job opportunities and population increase.

An intrinsic problem of urban-growth analysis is how to actually measure the economic growth of a city (Button<sup>49</sup> 1976). Strictly, one is attempting to analyze changes in the economic well-being of the community living within the urban area, but this leaves the problem of defining some proxy for welfare. In national-income accounting, per capita income is used as a surrogate for welfare, although the state of the environment, the standard of public services and the range of social amenities should also be considered. Economics however, cannot explain why certain cities grow faster than others. There is a tendency for the largest and most prosperous cities to attract investment – not areas with surplus capacity in their economy. The attraction of these cities is partly explained in terms of agglomeration and economies of scale.

It is generally true to say that firms catering for a national or international market, prefer to establish their main offices in the largest city because of the agglomeration economies that is offered there.

Urban growth does not simply vary between cities, but also fluctuates over time for any given city. Uneven economic growth introduces a degree of uncertainty into the investment decision, making the city less attractive to businessmen and occasionally leading to an outward migration of workers.

Three major determinants of the stability of the urban growth rate are the dependence of the city's economy on national business cycle, the industries the city specializes in and the flexibility of the local economy (Button<sup>49</sup> 1976).

Large cities frequently imply long journeys to work and considerable traffic congestion at peak times. This clearly imposes costs on individuals, and any attempt to minimize these by choosing accommodation near the place of employment will usually be offset by higher rents and house prices. In

addition, it becomes increasingly difficult to gain access to the countryside or other open spaces as the city boundaries expand outwards. At the same time, the larger the city the higher the prevailing noise levels and the greater the degree of pollution which has to be tolerated. There are also indications that psychological pressures increase with city size, manifesting themselves in high crime rates, greater mental illness and more suicides in the largest urban centres. It can be said that the 'quality' of the urban environment is inversely related to a city's size.

#### *4.3.4 Environmental consideration*

One topic that is now arousing increasing concern, is the environmental damage being caused to our cities by the motor-car. In many ways this particular problem typifies the type of situation which is emerging – the significant environmental effects which transport has in all aspects of urban life is considerable. This includes noise, vibration, air pollution, visual intrusion, dirt, loss of privacy, neighbourhood severance, accidents, pedestrian inconvenience, disruption, and general congestion. This is only one aspect of urban life that has such a profound effect on the environment.

Fragmentation, both functional and geographical, is a particularly strong impediment to environmental protection. Pollution rarely respects boundaries.

The problem of pollution and congestion results from the existence of externalities for which those who are responsible, are not being charged. Consequently, the solution is economic i.e. to make the polluters pay for the full cost of their activities. Local Authorities have been reluctant in adopting this approach and until legislation is enforced through strict policing or an economic approach to charging or standards is adopted, the urban environment is likely to suffer with high imposed social costs.

#### *4.3.5 Road Pricing*

The social and economic implications of road pricing have been a subject for wide discussion and debate. The strongest argument against road pricing is that, because it is based upon the price mechanism, its implementation could

possibly produce a situation where motoring becomes the privilege of the wealthy. A rather more serious problem concerns the uses to which the government puts the revenue from any pricing scheme.

Congestion is increasing on urban roads and to date no policy has been applied which seems to offer any hope of reducing or even containing the problem. Road pricing offers an effective theoretical tool but it appears to be politically unacceptable. Government attempts to combat the excessive use of motorcars in our cities with the carrot of subsidies for public transport and the stick of parking restraints on motorists has proved ineffective, this being at least partly due to reliance on administrative and financial principles rather than economic criteria.

#### *4.3.6 Policy*

As well as representing the centre of numerous economic activities, cities are also residential concentrations. The difficulty of providing adequate housing for the 80 percent of the nation's population living in urban areas is one of the major problems confronting policy-makers.

Policies towards cities have important benefits on national economic performance through their impacts on inter alia:

- Efficiency with which resources are mobilized, allocated and utilized;
- Employment opportunities and the productivity of the labour force;
- The linkages between rural and urban development.

Efficiency can result from a sense of public service that is reinforced by professionalism, political accountability, a clearer specification of expected standards, and performance-related pay and promotion structures. Market choice can be provided within the public sector by greater participation by users or by internal markets.



The provision of a service by a central government needs an element of local participation to avoid rigidity and overstrain. Single-purpose state enterprises may be more successful in developing and retaining skilled professionals, where they are in short supply. Small municipalities have obvious difficulties in deploying skilled personnel and equipment.

The quality of service management does depend considerably on two factors. The first priority is attached to the individual service as a result of its visibility and the political weight of its clientele. The second is the extent to which service quality depends on public behaviour as well as on staff competence.

Local authorities often play a highly effective part in implementing national policies of poverty alleviation, usually with financial aid from the central government or donors. A sense of ultimate responsibility for political position and stability may spur central government to attend to the needs of low-income groups in countries with inclusive political systems.

There is therefore an important rationale for improving the management of cities to encourage efficiency in the use of technical, financial and human resources in both the public and private sectors in the interest of economic growth.

The typical city administration is faced with the task of promoting economic growth so as to raise the living standards and trying to improve the delivery of infrastructure and services so as to avoid permanent damage to environmental resources in and around the urban area.

Considerations of bureaucratic efficiency and the elusive and related concepts of the human scale and quality of life, confront each other over the issue of "size", and the size is very much an issue on which the "marginal" laws of economics bear, as the following brief encapsulation of the applicable analysis reveals.

In a nutshell, there are three groups of actors, and three different sets of considerations in the optimum size debate. Their lack of common ground makes theorising about actual orders of magnitude academic. Economists theorize about three principles, the “administrative”, the “individual” and the “corporate”.

The administrative first; if there is any rational criterion applied at local government level it would be organisational efficiency, implying the size at which services can be delivered to the community at least cost. Typically what is shown to happen by Button is that a small community will incur high per capita costs of urban administration. As it grows the fixed costs will be spread over a greater revenue base and per capita costs in urban decline. But only up to a certain point. At some stage size will create organisational inefficiencies due to congestion effects, and costs will begin to rise. A plot of city size against per capita costs therefore will take a characteristic U shape not unlike the marginal cost schedule of a typical firm. For the Town manager accordingly, optimum size will be that population which corresponds to the turning point at the base of the U.

Of course, it can be argued that the analysis is flawed in many major respects. One universal inevitability is that as a city grows, the range of services it provides expands, and it is not possible to consider the city’s cost schedule as fixed in relation to its start-up condition. Another problem is that particularly in these times, services involve transfer payments between groups for which the administration is effectively only a conduit. Cross subsidies between high income/lower income groups in effective charging differentials for basic services, provide an example. The other damaging assumption is that there is implied a reliance on efficiency motivation in the urban sector, in applying efficiency to optimum size considerations within the Administration itself.

The individual principle is concerned with “which” individual in the final analysis. Expectations are that up to a point individual productivity will increase with city size due to economies of scale and agglomeration. There will also be economies of scale in the provision of certain services, policing

and public utilities being easy examples. In combination, always assuming that higher productivity will lead to higher income, the individual city dweller finds that up to the point where congestion starts biting, he becomes better off in net disposable income terms, as size increases. In addition, he is favoured by an increasing range of facilities and amenities, particularly those of a specialist character. The Central Place associations are strong. The advantages of course are apparent to outsiders and immigration swells numbers to the point where diminishing returns set in, and beyond. For the established resident, his optimum size is where average costs and average benefits first meet, on the size/cost graph, the two schedules appearing as opposed U shaped curves. Thereafter, costs depart from benefits to the disadvantage of this group.

Total net benefit is not maximised however until marginal cost and benefit coincide, “marginal” meaning the additional cost incurred or benefit derived, by the most recent arrival. However, it is economists who rationalise over marginal schedules, not individuals, and they will continue arriving up to the second point where average costs and average benefits meet. In short, the individual principle differs according to whether he is an established resident, or a potential immigrant.

If the individual is a businessman, his optimum city size will relate to the industrial or corporate, principle. And as with individuals there are different motivations. Profit maximisers will look for a “market” size that gives the greatest difference between total costs and total revenues. Revenue maximisers will be satisfied with a range of population – or market – size that shows total costs to be no greater than total revenue. With the former held constant, and the latter characterised by the usual U shaped schedule, this range will lie between two points of intersection of the two schedules. Needless to say, different industries will have different market size motivations and hence overall, there can be no conceptually valid city size optimum. Intuitively, cities can of course be too large. London, New York, Los Angeles all to varying degrees defeat the human scale, their social distress levels providing evidence that such is the case.

#### **4.4 Decentralization**

Most cities require not just organization, but a fundamental reorganization if they are to develop and implement cost-effective programs (Hawley<sup>28</sup> 1974, Rondinelli<sup>27</sup> 1990). Many social scientists and practitioners of city government speak increasingly of new approaches as essential for improving the delivery of services.

The distinction is often made in discussions of this subject between administrative and political decentralization. The former does not involve shifting power to community groups at all, except in the most indirect sense, and is rather a delegation of authority within city agencies from headquarters bureaucrats to those in district offices. It is in many respects an extension of top-down strategies and is meant to provide for greater administrative flexibility.

There are many assumed benefits that advocates of this strategy see as resulting from it. They include more relevant programming and accountability, more flexibility, innovation, and efficiency, more legitimacy for the agency, and, hence, more social peace about its operations, and more jobs within the agency for community residents.

There are many obvious ways in which the bottom-up strategy differs from the top-down one. There are more and different participants in the former, most of them dispossessed client groups and their leaders who question the legitimacy and effectiveness of existing agencies, regard "lay" judgements as important for the policy and programs. Their goals are much more diffuse than those of the top-down advocates and include all the assumed benefits mentioned above, especially jobs, accountability, policy and program power, and local control over the agencies.

As implied above, there is disagreement between many advocates of each of these two points of view over the relative importance they respectively attach to alternative diagnosis of the source of the problem, correctly pointing out

how many city agencies function without even the most primitive management tools, job descriptions, lines of authority, information systems, and the like. For them, creating a strong centre with vastly improved management capabilities is essential. Once that is accomplished, these top-down advocates often argue, then administrative decentralization could be encouraged to make the bureaucracy more flexible.

By contrast, most bottom-up advocates argue that over-bureaucratization is the problem, pointing out that the proliferation of rules, procedures, programs, bureaus, and agencies, has prevented the effective delivery of services. They suggest that many of the benefits assumed to result from centralization and bureaucratization did not result. There was not more professionalism, not economies of scale, not area-and citywide planning in most instances, and the costs were quite substantial.

Among the questions that have received relatively little discussion in the debate over decentralization, are those dealing with its fiscal aspects. For example, what impact will decentralization have on the costs of public services and how will fiscal constraints, in turn, affect the political consequences of such changes.

One perennial strategy for improving the delivery of urban services is government reorganization. The major questions in this respect are:

- how organizational change can be achieved?
- what its general direction should be?
- how change can be institutionalized?

There are some students of urban management who argue that various strategies will not significantly improve the delivery of services because they leave untouched the main obstacle to such improvement - namely, the monopolistic position of city agencies.

The public is the captive client of such agencies and has few if any options to seek alternative sources for the services. Yet, monopolists have no incentive to innovate or improve. The strategy thus urged by these advocates is to create alternative parallel systems to the existing agencies as a way to revitalize them. The argument is that large, monopolistic organizations – in this instance, municipal agencies – almost never make major changes in established patterns of behaviour unless strongly pressured to do so by outside forces. They generally view innovations negatively, as upsetting routines to which they become accustomed. Even an active consumer movement, is not enough to make a difference.

The more generalized version involves subcontracting out for the management and delivery of a public service to a private sector organization like a business firm. This is based on the diagnosis that the public sector has a number of characteristics that preclude it from ever being an effective manager. They include the fact that policy-making is fragmented, that it is divorced from execution, which is governed instead by the inertia of large bureaucratic empires – departments, divisions, and special programs – that become autonomous ends in themselves, directed by their own narrow vision and desire for power.

There remain other important contributions that the private sector can make to improve city government.

A theme which underlies almost all analyses of the so-called “urban crisis” is that the power necessary to achieve change is institutionally fragmented and inadequate. Cities, of course, do not exist in a vacuum and are part of a larger system in which substructure, local authority and state – as well as local municipalities – play important roles in the delivery of services in cities. There has been increasing concern among political scientists and public officials about some of the dysfunctional aspects of this system.

The argument continues that competition gives the consumer or client more options than he had before, and that it forces monopolists to change, as the

new agencies begin to draw away clients and funds. This can only work effectively, however, if there is an accurate and comprehensive evaluation system whose results are well publicized to the various client groups. Under those conditions, competition might indeed work, as new agencies develop a diversity of approaches to delivering the service that the older mainstream (monopolistic) agencies will feel compelled to incorporate, if they want to maintain their privileged position.

As we consider all of the possible things that might be done to improve urban management, it is clear that it is much easier to develop ideas for new structures and procedures than it is to get them adopted and implemented. Indeed, a major reason for the failure of municipal agencies to deliver services more effectively and to change is a political one. The power of civil service groups and municipal employee unions along with the fragmentation among reform groups has often made it difficult to achieve change. A major item on the municipal agenda, then, is how to put change coalitions together.

#### **4.5 Service delivery**

Citizen concern about the quality of the public services they receive – from their municipalities, local government and state governments and from their schools – is nothing new. Surprisingly, however, until very recently, governments themselves and others have done little to measure the quality of these services (Chase<sup>13</sup> 1993). Even readily available information, such as citizen complaints, has seldom been recorded and tabulated in useful ways.

In the Western world, massive criticisms of the quality of public services gained momentum in the post-world-war-II years as the civil rights and anti-poverty movements grew. Middle- and upper-class citizens joined in the questioning of service quality in recent decades when they sensed that their interests were threatened by exploding population, pollution, crime, and uncontrolled urban growth. The urgency of the issues, combined with the escalation of government costs and the resulting tax increases, have tended

to force government officials to justify their activities in terms of the quality of services they are providing.

Though there are many dimensions to the urban crisis, clearly the task of improving the capacity of government to deliver services is critical. Solving this problem alone may not restore the nation's cities and metropolitan areas, but it would at least help a lot in getting on with that task.

Certainly, there are no easy answers, no simple or final solutions, and no prescriptions that apply in all or even most cases.

The problems are complex, and it will be necessary to devise comprehensive formulae for increasing the effectiveness of urban governments. We will need more high-powered management techniques and structural reorganization; metropolitan wide authorities for some problems and decentralization for others; the introduction of more service choices and an increase in the capacity of administrators and –more importantly – elected leaders to act decisively. The appropriate mix of strategies will depend, of course, on the needs of the people in particular locales. Where there is the wisdom and the imagination around to develop and implement multi-dimensional approaches to the problems of urban management is uncertain.

Following are some examples of the purposes of a few common public services for which measurements are likely to be needed.

- Solid waste collection – removal of health hazards; providing streets that are reasonably free of garbage and litter.
- Crime control – reduction of crime.
- Transportation – moving traffic rapidly and safely; providing accessibility to major work, recreation, and shopping areas; providing smooth-riding streets.
- Meeting the basic economic needs of families unable to provide for them.



Generally, one is able to evaluate service delivery into seven broad categories of quality. They are:

*4.5.1 The lack of delivery of a full range of services,* may be due to limited resources. It also may occur because clients are not made aware of the available service. The quantity limitation may also be in the form of not providing the full range of service ideally desirable. Officials may feel it necessary not to make fully clear the availability of certain services if their resources are so strained that such publicity would likely lead to exceeding the capacity of the system. This of course would relate to the openness and transparency policies adopted by the agency.

*4.5.2 Equitable distribution of the service.* Low income groups, racial groups, the aged, children, and so on – were not receiving appropriate shares of certain public services. The concern with environment and growth issues have substantially increased attention to the distribution of services to particular geographical areas within a city. Because citizens residing in different areas may have dissimilar needs or problems, identical government services to everybody may not be suitable or fair.

*4.5.3 Courtesy and respect with which the service is provided.* Many public services involve direct contacts between government employees and citizens, as well as contacts by telephone or by written communications. The manner in which these contacts are handled affects the satisfaction of the clients and therefore is an important aspect for quality measurement.

*4.5.4 Response time in providing a service.* Many if not most, government services have some aspect for which it is better to provide a service more quickly. There are the obvious situations, such as police and fire response times to calls, where speed of response maximizes the likelihood that a crime will be stopped in the process.

Speed of response is also an important factor in other services – in the repair of water and sewer breaks, providing a book requested at the library, and the

handling of citizen complaints for any public service. Response-time considerations include both the initial waiting period needed to obtain attention as well as the time it takes to obtain satisfactory service after the initial contact has been made.

*4.5.5 Amount of citizen use of a service.* One way in which citizens express their desires and satisfaction with a service, is whether or not they utilize the specific service.

*4.5.6 Citizen perceptions of their satisfaction with a service.* Citizen satisfaction is a subjective matter, but to ignore it is to avoid an important aspect of the adequacy of the service. For example, in the matter of crime protection, citizen feelings of security are also quite important as well as actual crime rates in a community.

To a greater or lesser degree in most government services, this dimension – citizen perception – is an important aspect of the quality of the services and should be measured. Some have argued that consideration of citizen perceptions would lead governments to emphasize publicity campaigns to increase citizen satisfaction with a particular service, rather than to put resources into truly improving them. The view is not without merit, but good government seems to require a balance of both functions – offering quality services and encouraging citizens to use and appreciate them.

One form of information about citizen perception is already commonly available to local governments: counts of reported citizen complaints.

*4.5.7 The efficiency of providing the service.* Although these aspects often are not considered part of quality, it can be viewed that an efficient, highly productive, economical operation is an aspect of the quality of a governmental service.

These seven categories of quality indicate that to fairly describe any public service, multiple measurements will be needed. It will be tempting to many

analysts and others to attempt to develop a single quality index that encompasses the various quality attributes of a particular service or program. Such single indexes seem to be much easier to handle. However, the warning is necessary that such indexes are synthetic, they necessarily include value judgements as to the weightings of each separate measurement comprised by the index. They have the danger of burying needed information and oversimplifying issues that are inherently complex.

#### *4.5.8 Benefits from measuring public service quality*

- Indicate where problems exist. Measurement results will often suggest where government attention should be directed.
- Provide feedback on the performance of programs and policies. This can be particularly instructive after new services and broad programs have been initiated.
- Assist in determining priorities for allocating government funds and manpower.
- Help evaluate government management and establish employee incentives. Quality-of-service measurements can serve this function if they are undertaken regularly and systematically. As reliable and comprehensive measurements become available, their use in incentive programs for management and employees are likely to mark an important new trend in local government.
- Permit greater community involvement in determining the priorities of government activities. As quality-of-service measurements come into wider use, they inevitably will become public. Citizens could then respond and make requests that take such measurements into account. The quality of citizen interaction and interest in government activities would be likely to increase. Not everyone believes this is necessarily a good thing, but at least up to a point, it is essential to the democratic system.

One of the major obstacles to undertaking quality-of-service measurements has been the belief that such measurements are extremely difficult, if not impossible (Chase<sup>13</sup> 1993). Another important obstacle is that their costs may

be substantial. It is clearly impossible to measure all conceivable aspects of quality for any given service. For formal program evaluations, it is not feasible to assess every program every year. Considerable selectivity is needed in measurement.

#### *4.5.9 What is to be measured?*

Earlier discussion suggests that several different types of measurements are necessary to evaluate organizational effectiveness. These include the cost and output levels of production in order to gauge production efficiency, and the match of output mix to the apparent preferences of citizens and consumers.

To evaluate organizational changes, it can be generally agreed that it is necessary to fix or systematically vary certain policy variables – namely, organizational parameters, among sample points or evaluation sites. Systematic variation allows for the determination of differences in performance of services produced under radically different organizational arrangements or can help derive information on how particular arrangements may be “fine tuned” or “optimized”.

The problem arises in attempting to develop an evaluation design that will separate the effects of two different kinds of policy variables – program variables and organization variables. In particular, it must be resolved whether, in an evaluation of organization, program variables are to be fixed or systematically varied, or left uncontrolled. Here we face an apparent dilemma. If program variables are left uncontrolled, and suppliers operating under different organizational arrangements are allowed to choose whatever methods they prefer to achieve results, then how is one to separate the effects of organizational arrangements from the effects of the selected programs? On the other hand, if we hold program choices fixed by imposing a particular delivery method or a systematic set of variations of delivery methods upon particular suppliers operating under different organizational arrangements, we do not allow organizational arrangements to work as they are supposed to. In particular, suppliers will not be permitted, within the

context of the incentives they face, to re-evaluate their methods and change course in response to perceived problems in performance; yet the inclination and capability for such evaluation and adjustment behaviour will depend on incentives implicit in the organizational arrangements. Thus, if program choices are controlled, only a very limited evaluation of the short-run effectiveness of an organizational regime can be obtained. The crucial long-run effects of organization – on program choice, innovation, and change – would be blocked. Thus, it seems necessary to opt for an evaluation strategy, which does not tightly control program choices. Other means, especially the selection of an appropriate time period for conducting the evaluation, must be exploited to help separate the effects of program and organization.

#### **4.6 Systems analysis**

Let us try to clarify the concept of systems analysis by exploring both its potential usefulness and some limitations to its usefulness.

The concept is not new; decision-makers have sought systematic, useful, and creative answers since the days of the shaman and medicine man. What is new, is the number, importance, difficulty, and profound implications of decisions confronting responsible officials everywhere, especially in our urban complex. In the urgency to resolve the problems necessary for making “good decisions”, an urgency often bordering on desperation, the modern urban manager has turned increasingly to anyone who claims or even appears to have answers to his problems.

The plain fact is that no one really knows what to do; no one really understands many of the complex systems in which we all participate.

A basic question underlying this issue and guiding the following discussion can be simply stated: How can a complex society institute needed changes without great cost or extraordinary disruption?

Creative imagination must be brought to bear on this matter, and the systems analysis concept has much to offer (Checkland<sup>51</sup> 1990):

- “Help a decision-maker”: This statement implies a demand and expectation that the client-analyst relationship will be based on shared experience and rewarded according to the degree and kind of benefits resulting from the relationship i.e. if the analyst does his job well, both he and the client benefit – and the converse.
- “Choose a course of action”: This implies that one should adopt a manipulative, rather than a simply contemplative, attitude toward the subject matter, with manifest concern for the present and emerging future.
- “By investigating his full problem”: This implies the importance of identifying and specifying the problem, selecting problem elements that are of interest and use to the decision-maker, and comprehensive – rather than narrow, partial, or specialized – treatment of the problem.
- “Searching out objectives and alternatives”: This implies the importance of creating new solutions and assessing them in light of the goals of the participants.
- “Comparing them in the light of their consequences”: This indicates the need to predict, as well as possible, the most probable rewards and deprivations likely to accrue to the participants.
- “Using an appropriate framework – insofar as possible analytic”: “Appropriate” means capable of satisfying and incorporating all the foregoing requirements; “analytic” stresses the need to use data responsibly.
- “To bring expert judgement and intuition to bear on the problem”: This re-emphasizes the client-analyst relationship and implies that each has an important and distinct role to play in understanding and solving the problem.

To recite the limitations of a concept as general as systems analysis, even restricting them to applications in the urban complex, is to assess the failings of analysis and applied research in general.

The systems analysis concept as it has been applied, my intention is fundamentally a constructive one: Where have we been; where are we now; where could we go; and what seems to be holding us up?

#### *4.6.1 Systems Analysis in an urban complex*

As a concept, systems analysis is both very straightforward and enormously complicated.

A systematic approach to helping a decision-maker choose a course of action by investigating his full problem, searching out objectives and alternatives, and comparing them in the light of their consequences, using an appropriate framework – insofar as possible analytic – to bring expert judgement and intuition to bear on the problem.

There is a fundamental problem that limits the creative application of systems analysis to society's problems. Without precise and specific statements of goals – both for individuals and collectivities – attention in the social indicator movement has focused on the development, collection, and description of objective indicators. The basic problem, and rationale, for this preoccupation with measuring “things” is that we just do not know how to relate the objective and subjective dimensions well enough to do the measurement.

A related question that is seldom asked is what an answer is. That is, what is an answer or an acceptable range of answers? Should it or they be sought or allowed to “fall out” of the analysis?

What the problem is and what an answer is, are deceptively simple questions. They should be asked early in the analytic process, during the proposal or design phase. These questions assume mutual trust and respect between client and analyst. They presume that both parties can sit down, be honest with each other, decide what the problem is, and then ponder a few plausible answers. The question of what an answer is, though less often raised than the first, is just as crucial because it helps ensure that the selection process will operate to include, not exclude, needed information. Information that

would be technically optimal is seldom politically or socially preferable; the question, if honestly posed, may present an analyst with a serious dilemma.

#### **4.7 Quality of life**

Quality of life has been the rallying cry of many proponents and theorizers of social indicators, but it means many things to many people. The concept defies clarification and measurement.

At a minimum, we can distinguish between objective and subjective dimensions or components of the quality of life. The former is manifested by efforts to measure the condition of the environment, such as the kind and amount of pollution, the amount and quality of existing housing stock, and so forth. Assessed also are individual people's conditions, such as their family, and so forth. In the second, or subjective dimension, personal experiences and attitudes are assayed: What are individual levels and kind of frustration, satisfaction, aspiration, and perception?

The analyst's general attitude toward his subject matter is crucial in determining how the subject will be perceived, analyzed, and interpreted. If one has a predilection for seeing linear, orderly, static, and rather simple patterns in the world – as a statistician might – that suggests strongly the preferred methods and likely forms his abstracted views of the world will take. If, because of prior training, personal idiosyncrasy, and the like, one looks at the world as composed of a small number of important elements configured in nonlinear, deterministic ways – as an engineer might – another set of methods producing a different world view will result.

#### **4.8 Community participation**

After decades of protest and demands for participation and community control, urban government appears to be entering a new era. Now that the



“urban crisis” has been discovered, debated, and in some quarters dismissed, government officials and academic analysts alike have increasingly come to focus on “service delivery” as the central issue and problem of urban policy-making.

This shift from “crisis” rhetoric and dramatic solutions to the discussion of service delivery is in itself highly interesting. As compared with hopeful plans for community control, the quest for improved public services is a more modest and limited urban “solution”. In particular, it represents a new emphasis on everyday urban problems and on the capacity of government to perform basic functions. In this sense, the service delivery orientation hits closer to the lived experience and expectations of urban residents than the previous, highly generalized desire to “save the cities”.

A major limitation of urban systems analysis is the virtual lack of suitable management information system support for these activities. While we have been developing Management Information Systems (MISs) for over a decade, the development has been slow and the results have not been too exciting. What seems to be missing is a thorough, critical examination of these developments to sum up what has been learned so that the next decade’s efforts may bear fruit faster.

The relationship between government and urban residents in service delivery is constant, salient, and tangible: all of which we might expect would stimulate citizen interests and demands on government. On the other hand, citizen interests and demands are fragmented by the very nature of urban public services. That is, because urban services are personal, direct, and locality-specific – in terms of both delivery and citizen needs – highly divisible. In terms of delivery, urban services, in contrast to pure public goods like national defense, can easily be “divided” – allocated differentially to different groups of citizens.

More important, urban residents have very different needs and demands for urban services. While citizens have a relatively undifferentiated need for

national defense or postal service, urban residents have particular locality-specific needs for services like police, fire, education, and waste collection - neighbourhoods differ in their demands as between services.

In short, demands by individuals and neighbourhoods for a particular service, differ both qualitatively and quantitatively. In terms of quality, differences in community structure strongly affect the precise nature of service demands. In terms of quantity, economic, social, and physical factors affect the amount of fire protection and waste collection required in an area.

Viewed from this perspective, the problem of urban management today is that, instead of asserting, that there is no African National Congress/National Party way to clean the streets, we are now asking whether government is capable of cleaning the streets at all. That we should have moved from a confident expectation to an open question about the city's capacity to deliver basic services indicates that the service delivery issue cuts very deeply. Indeed it raises fundamental questions about the structure and functioning of the urban political and administrative system.

Improved management and service delivery depends not so much on introduction of new money or new efficiency experts but on the relationship between the structure of public service institutions and the structure of citizen demands. The student of urban management must focus on citizen demand for public services, the bureaucratic organization of service delivery, and the point of intersection between the two: the street-level relationship between citizens and public employees.

If urban management is frustrated by mutually reinforcing patterns of fragmentation rooted in the structure of urban government, what solutions can be applied to urban "problems"? As a first-cut at this question, it should be clear that the toughest problem for the urban administrator to deal with is that of fragmentation in intergovernmental policy-making.

#### *4.8.1 Aims of reorganization*

We must clarify what we wish to accomplish by reorganization. The goals that are implied by reform rhetoric and by the obvious problems of city government are divided into the following categories:

- **Equity:** to improve the distribution of public goods and services, assuring that various parts of the city get their fair share;
- **Adaptability:** to facilitate the adaptation of the mix of services and the way in which they are delivered to the varying desires and sensitivities of people in different parts of the city;
- **Community:** to give institutional expression to a sense of community and neighbourhood pride;
- **Finance:** to slow the spiral of city government costs, easing the local tax burden, and increasing the funds available for priority needs of the city's people;
- **Management:** to improve the operations of government by speeding and expediting action, facilitating coordination among interrelated functions, and encouraging imagination and innovation;
- **Accountability:** to make public employees more loyal to the policy goals set by elected officials and improving procedures for calling them to account for low productivity, insensitivity, or graft.

Participation is an important end in itself. The first part of that goal is enhancing the opportunity for individuals and local groups to influence the urban environment.

Another aspect of participation is improving the access of the citizen and small groups to points of formal decision-making, wherever they may be (Abbott 1996). Patterns of communication in and out of government are important from this point of view. Information is a vital part of effective influence. Insofar as officials responsible for certain matters are known and accessible, they feel more pressure to respond to reasonable complaints and demands.

## **4.9 Public/Private Sector**

Business executives trained in management techniques – planning, goal-setting, organizing, controlling, performance appraisal, work flow analysis, and the like – have a lot to offer the public sector to make it more productive, and in some instances to promote organizational change as well.

The basic question of the program and of my assessment is: Are management skills developed in the private sector in fact transferable to the public sector? The belief in certain circles are, that they are and have spent the past number of years developing programs based on that assumption. Some government officials believe that they are not, arguing that conditions in government are so different.

Therein lies a key problem of municipal management: monopolies, whether public or private, tend toward inefficiency. Since most city agencies are monopolies, their staffs are automatically in a position to exercise that monopoly power for their own parochial advantage – and efficiency is rarely seen as an advantage. In short, we have unwittingly built a system in which the public is at the mercy of its servants; many municipal agencies are malfunctioning monopolies that no longer serve the public interest, but their own. However, the inefficiency of municipal services is not due to bad mayors, managers, workers, or unions; it is a natural consequence of a monopoly system. The public has created the monopoly, the monopoly behaves in predictable fashion, and there are no culprits, only scapegoats.

In addition to this inefficiency, monopoly systems are inherently unreliable because of their vulnerability to strikes and slowdowns.

Employee groups within a monopoly can always arrange work slowdowns and carefully contrived absenteeism to achieve the effect of a strike, while getting around no-strike laws and avoiding prosecution.

Issues regarding greater dependence on the private sector to perform services which otherwise might be performed in-house by government agencies.

- First is the production of what I call public interest services – those goods and services which government undertakes, for whatever reason, to supply or to have supplied to its constituents.
- Second is the use or stimulation of the private sector to promote economic development in squatter areas, thereby relieving governments of responsibilities and activities which they would otherwise have to assume. While this is a bit outside the usual definition of “privatization,” it raises many of the same issues and deserves treatment in a discussion of the private sector’s role.

Interest in privatization has been stimulated by three factors, all of which have been magnified over the last decade.

One is the growing cost of state and local government services, in turn caused by rapid increases in the amount of personal and other services purchased, and by the rate of cost inflation in the public sector (greater than that of any other major economic sector save private construction).

The second factor is the apparent inability of urban governments to cope with the increasing demands thrust upon them, as manifested by growing congestion, pollution, crime rates, delinquency, and dirty streets, worsening housing for low-income groups, declining pupil performance in black schools, and declines in other indexes of civic quality. These conditions in turn reflect in part (a) the increasing magnitude of the problems faced by local governments, particularly governments of large cities inundated by the new wave of immigration from rural to urban areas; and (b) the political and organizational inflexibility of many local governments, and their inability to adapt to changing economic and demographic conditions and demands for service.

The third factor concerns the widely held belief that public bureaucracies are inherently less efficient, in the economic sense, than are private firms dominated by the profit motive. In addition to the ideology which regards private enterprise as the natural order of things and the public sector as a necessary evil, several reasons are advanced for thinking that the public sector is inherently less efficient than the private.

The chief advantage of a regulated private utility over a public corporation would therefore seem to lie in the possibility of attracting more capable management through various compensation devices (stock options and the like) available to private corporations. Whether or not such devices actually attract better managers or produce more efficient operations is an open question. (Efficiency here connotes industrial engineering and human relations techniques, as opposed to financial manipulation).

On the other hand, public service offers certain rewards in the form of prestige and satisfaction that are thought to appeal to an increasingly large group, notably many able younger people. To some, they also offer the relative security of employment together with considerable perks not offered by private organizations e.g. housing subsidies.

Governments can benefit by arranging for private-sector agencies to perform public interest services by taking advantage of one or more of the following:

- advantages of competition, not only between private and public sector agencies but also between private organizations;
- economies of scale and specialization – these may be obtained by contracting with specialized private firms, or larger governments, or by combining with other governments to produce the service;
- escape from the rigidities of personnel, budgetary, and other central controls imposed by general government agencies;

- greater freedom to discontinue contractors or services which prove to be less effective, and
- use of incentive devices, such as bonuses for superior performance.

There are also a number of disadvantages.

- the danger of becoming trapped in a relationship with a single firm;
- the extra legal activities frequently practiced in order to get and hold contracts – political contributions, kickbacks, collusion among bidders, bribery of inspectors, and so on;
- the difficulty of drawing contracts for services that cannot easily be defined or identified in a way which permits the use of incentives (most government contracts pay little attention to efficiency incentives);
- the necessity of closely monitoring and inspecting the processes and output of contractors;
- the difficulty of compelling a deficient contractor to perform satisfactorily; and
- public suspicion, arising from past experience.

There is both opportunity and need for greater involvement of private organizations in public interest services, particularly social services.

A continuing need in the social program area is more experimentation and demonstration. Here, private organizations also can play an important role; however, financing must come mainly from government and philanthropic sources. One promising field for experimentation has to do with the use of incentive-contracting, in which payments are related in various ways to the achievement of specified objectives, such as the quality of services performed.

A career development system would reduce resistance to the recruitment of qualified candidates from outside the system, provided that the selection-promotion process provided opportunities for those with motivation and ability to increase their skills, status, and earnings.

Management in the private sector is beginning to recognize that developing employee potential is not only worthwhile but that its benefits can be quantified; investments in human resources, to improve employee's educational levels and skills – which are both necessary in today's urban labour market – are in many cases amply justified by the returns which such investments generate. To survive, such programs in the private sector must pass the test of profitability but in the public sector other, more flexible and socially responsive standards can and should be used. All the relevant tests appear to strengthen the case for moving in this direction.

#### *4.9.1 Participation: worker-initiated*

In this form the company creates a suggestion system or similar means for receiving and investigating worker ideas. Thereafter the initiative for participation rests with the workers. The company, however, commonly urges participation through offers of attractive awards for valuable ideas, by publicizing successful cases, etc. The company can also influence the choice of subject matter by offer of special awards, e.g., for suggestions on improving quality.

#### *4.9.2 Participation: management-initiated*

In this form the supervisors and managers take the initiative by asking workers for their ideas on specific problems. The daily or weekly meeting is an obvious example. In addition, there are many projects in which managers find it worthwhile to make use of the knowledge that workers derive from long association with the process.

#### *4.9.3 The Japanese Quality Circles (QC)*

A quality circle comprises a group of about 10 workers and work leaders within a single company department. It is created for the purpose of conducting studies to improve the effectiveness of work in their department. The studies are not restricted to quality. Many projects involve productivity, cost, safety, etc.



Participation in QC's are voluntary. The work of the circle begins with a training course, which consists of three major elements:

- Training "by the book" in various techniques of data collection and analysis, i.e., statistical tools, Pareto analysis, Ishidawa diagram, etc.
- Study of successful projects worked out by other QC circles; and
- Proving the effectiveness of the training by completion of an actual project, using such assistance as may be needed from outside the circle.

In Japan the QC circle movement has been stunningly successful. By the end of 1978, about 7 million workers had undergone the training and participated in project studies. Since 1978 the developed countries of the West had produced no effective equivalent of the QC circle as their means for utilizing the education, experience, and creativity of the work force. Only the developing countries of Southeast Asia (and Brazil) had organized QC circles in any significant numbers.

Whether the QC circle can be adapted to the culture of the West remains to be seen. The limitation is not technological – it is cultural. In the West the cultural resistance arises from two major sources:

- Managers and engineers are reluctant to delegate to the work force the functions and prerogatives to which they have clung so tenaciously in the past.
- The work force does not consider that it has a responsibility to help the managers improve the company's performance.

# CHAPTER 5

## TOTAL QUALITY MANAGEMENT (TQM)

### 5.1 Definition

Total quality is defined as a set of principles and methods organized as a comprehensive strategy with the goal of mobilizing the entire company in order to achieve the greatest client satisfaction at the lowest cost. It involves:

- All company functions;
- All company activities;
- All employees, regardless of their rank in the organization;
- All relationships: client-supplier as well as inside the company;
- All improvements in quality: resolution of existing problems and prevention of their recurrence;
- The entire life cycle of the project: from its procurement, design until its construction;
- The relationship with suppliers, subcontractors, partnerships, networks;
- Monitoring of all markets, current and potential.

The objective of total quality is to constantly improve the quality of products and services and the use of human and material resources by monitoring and permanent surveillance of new developments and by identification of potential new markets. The objective is also to take the path towards perfection for the benefit of the company and the satisfaction of individuals and to the benefit of clients. For the customer, total quality can be defined as delighting the customer by consistently meeting and consistently improving on his requirements. This definition is similar to that of quality as given by Juran, with the exception that, for total quality the continuity of the process is accentuated. With the evolution from traditional corrective inspection methods to quality control mechanisms embodied in the concepts of total quality, the

organizational culture improves from an environment of distrust to one of confidence.

“Excellence” is a collective model that brings companies toward a Total Quality culture that embodies the concept of ‘zero defect’. Doing it right the first time means meeting the commitment that has been made. Doing it right the first time, every time, means meeting the same commitment for each request by the client. To do even better, one might set a realistic initial goal, capable of achievement. When that goal is achieved, another one can be set, with improved conformance. That is the “journey towards zero defects”. It is this line of reasoning that prompted Crosby<sup>23</sup> to say “Zero defects is not a destination, it is a journey”.

TQM has five guiding principles:

- creation of an appropriate climate;
- focus placed on continuous quality management by fact/data;
- people-based management;
- continuous quality improvement; and
- Training - emphasis on training senior managers first because they initiate the changes required. Training is then cascaded to the rest of the company, concentrating first on staff with any co-ordinating, leading or management role.

It is essential for us to understand that in a TQM system, clients are not only external but also include internal customers. Not only other divisions of a company which are providing a product for further processing, but all others which may be affected in one way or another. Crosby’s definition takes on a whole new meaning. It suggests that all entities within an organization must comply with the quality requirements imposed upon them in order to deliver a quality product to the external customers.

Total quality management is a company-wide continuous improvement process that involves everyone not only in solving problems but which is of greater importance in preventing them. The use of the tools and techniques of TQM can aid the process of creating a new culture by encouraging teamwork, breaking down barriers, stimulating the learning of new skills and techniques, increasing the understanding of company processes, etc. To allow the TQM process to yield results, time and other resources must be made available for the solution of problems.

## **5.2 Historical Foundations of TQM**

According to some researchers, Deming's well-known 14 points form the core of the total quality management philosophy and as originally set forth by Deming, are applicable to all industry types (Chase<sup>13</sup> 1993). Deming's prescription for beleaguered Japanese managers was to improve their products by managing the quality of their processes. Building upon ideas and techniques learned from Shewhart, Deming taught the Japanese the concepts of statistical process control (SPC) and the importance of quality responsibility and improvement. Like Deming, Juran was instrumental in the Japanese economic turnaround following World War II. Whereas Deming stressed the need for change and a focus on quality at all organizational levels, Juran emphasized the key role management plays in the quality improvement process.

The teachings of Deming and Juran as well as other quality gurus, were later adopted by Japanese construction owners and contractors in the 1970's and by the US managers in both the manufacturing and service industries in the 1980's (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993). Notwithstanding the subsequent success of the TQM philosophy in helping to turn around both Japanese and US industries in general, leaders have been slow to recognize the potential benefits of TQM (Kubal<sup>15</sup> 1996). However, executives and managers now have begun to realize the benefits of the systems perspective of TQM in addressing inter-organizational and intra-organizational problems.

The concept of “customer” is broader in scope in the context of TQM than in the traditional business environment. A customer in the traditional management environment is the purchaser of a product or service; in the construction industry for example, this is the final owner of the constructed project, in urban management, the customer could be you or I. However, in a TQM-based environment, a customer is anyone who depends upon the output of others.

The TQM principles of continuous process improvement with the goal of achieving customer satisfaction, can therefore be an effective means of improving quality at every process level if an organization is willing to rethink many of its basic operating principles, including fundamental meaning of who constitutes a customer.

Prescriptive measures for applying TQM in urban management related contexts are abound in the literature. Researchers have developed models (Chase<sup>16</sup> and Federle 1992; Chase<sup>13</sup> 1993), described frameworks (Burati<sup>2</sup> et al 1992a; Strange<sup>17</sup> and Vaughan 1993) and made recommendations (Federle<sup>18</sup> and Chase 1993) useful toward the implementation of TQM. As a counter-point to the work of experts that extol the benefits of TQM in industry, Demski<sup>19</sup> (1993) presents a cautionary treatise on the value of identifying potential sources of resistance to fundamental organizational change, such as is required by TQM, and discusses the importance of corporate culture and leadership in the successful implementation of TQM.

As is evident from the preceding discussion, the preponderance of existing research is focussed on prescriptive measures for the implementation of TQM in the general urban context however, few attempts have been made to empirically investigate the impact of TQM on actual performance outcomes for any particular field within the engineering management context. One reason for this may be that many in the industry have shown reluctance to embrace TQM as a management strategy. A source of this reluctance may be because

of the relatively widely-held belief that TQM is for the manufacturing sector alone, and is not suitable for any other service related sector (Griffis<sup>23</sup> 1992).

### **5.3 Benefits of TQM**

Literature studies show that there are a wealth of company executives who have recognised TQM's potential. Burati reports that in the early 1980's, owners of multi-faceted organizations who had successfully implemented TQM in their main manufacturing business began to "adapt TQM to their engineering and construction programs" (1993, page 456). The experiences of these and other TQM pioneers have provided frameworks for applying TQM principles to the various disciplines contained within the urban management. Thus proponents of TQM offer the following as evidence of the applicability of TQM for these disciplines:

- Many of the functions associated with engineering projects are common across the design and construction techniques (Chase<sup>13</sup> 1993), and are therefore responsive to continuous process improvement.
- By doing a quality job, expensive rework and maintenance is minimized (Burati<sup>2</sup> et al 1992a). "Improving the process and thereby avoiding defects is usually less costly than the typical approach of attempting after the fact to inspect out defects".
- Training and education of the workforce has much in common with the techniques used for safety training and awareness (Burati<sup>2</sup> et al 1992b).
- Short-term costs to implement changes to improve quality will return long-term dividends many times greater than the costs (Culp<sup>21</sup> et al 1993).

The track records of some organizations affirm that TQM is not only a viable option, but a potentially successful one. In addition, TQM provides organizations with the opportunity to:

- Increase their success rate in a competitive environment;

- Save millions of rands through waste elimination;
- Improve profitability margins and schedules; and
- Decrease unnecessary and expensive maintenance activities.

#### **5.4 Existing TQM models/Conceptual Frameworks**

A number of TQM models and conceptual frameworks exist in the literature (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993; Graves<sup>14</sup> 1993; Strange<sup>17</sup> and Vaughan 1993). For example, Chase<sup>13</sup> (1993) developed a 10-element model for TQM based on the input of contractors with formal quality-management programs shown in Figure 1. In many respects, these models do not radically differ from the fundamental principles typically associated with TQM – it is the implementation of the principles that is idiosyncratic to the industry.

Although the existing models for TQM vary somewhat, key elements of these models include:

- Top-management leadership in and an unwavering commitment to the TQM program
- An organizational structure designed to support the TQM effort – often with key personnel assigned to oversee the TQM program.
- Improved communication both within organizational frameworks and across organizational boundaries.
- Training in TQM principles and practices for all managers and employees.
- Process improvement through statistical process control (SPC).
- Customer satisfaction as the ultimate goal for every employee.
- Supplier involvement and improvement.
- A focus on employee involvement.
- Continuous improvement.

In contrast to some of the industry specific principles and practices described, the general TQM literature offers conceptual frameworks and models that are

purported to be applicable across all industries. For example the Malcolm Baldrige National Quality Award<sup>22</sup> (MBNQA)(1997) shown in Figure 2, offers a more general framework of TQM.

In general, there are commonalities between the TQM models and frameworks proposed for use by the engineering management continuum and those presented in the literature that claim to transcend the boundaries of a particular industry. Many are anecdotal or descriptive in nature (Burati<sup>2</sup> et al 1992b; Chase<sup>13</sup> 1993; Crosby<sup>23</sup> 1979; Deming<sup>11</sup> 1986; Juran<sup>12</sup> 1988; MBNQA<sup>22</sup>1997), but others have been empirically derived (Ahire<sup>3</sup> et al 1996; Anderson<sup>24</sup> et al 1994; Black<sup>25</sup> and Porter 1996; Flynn<sup>4</sup> et al 1994; Saraph<sup>6</sup> et al 1989). Many other constructs are considered as either relevant, offering differing approaches or considered part of TQM or leaning towards the successful implementation of TQM. The literature clearly states the necessity for top-management commitment, improved communication and adequate training and education within the ranks stemming from management down to shop floor.

## **5.5 TQM and urban management**

City management has been grappling with a number of problems on various fronts whether housing, education, transportation and planning. Foremost among these are problems in quality, productivity and service delivery. Some of these sectors have begun to deal with its problems by following the lead of the manufacturing industry in embracing TQM. TQM provides a framework for improving quality and productivity through continuous process improvement based on a customer-oriented focus. In the context of TQM, a customer may be internal, i.e. an employee of the firm, or external, i.e. a client or a member of the community. The goal of project participants is to perform the work in a manner that leads to customer satisfaction for both internal and external customers.



In the light of this goal, findings that have emerged from the literature search, indicate that any sector of city management, like quality, can be managed by focussing on process improvement. The successful implementation of TQM in an urban environment has the potential to not only improve key quality performance outcomes, but also improve the efficiency of a city. To this end, it is important to determine if, and to what extent, the implementation of TQM practices can positively impact on city management.

Even though TQM is currently viewed as a viable management strategy, the operating environment of engineering management has one characteristic that tends to set it apart from many manufacturing sectors – this “industry” is highly fragmented. This fragmentation has precluded an integrated approach to process and product management. However, TQM affords the industry the opportunity to overcome the adverse effects of fragmentation, and its related phenomenon, specialization, by creating a new paradigm in which client satisfaction becomes the primary goal. In this context, individual sectors or departments work in an integrated fashion toward improving process management so that the needs and requirements of the customer have priority over all other issues. Consequently, TQM has the capacity to diminish the effects of fragmentation, while it serves a framework for overall improvement in key performance measures.

- The third-world versus first-world perspective is rooted in the most common misconception about quality and that is the mistaken belief that quality is “goodness”. Recognising that quality is not “goodness” is crucial to an understanding of the quality discipline.
- The real definition of quality must be defined as to whether quality is “fitness for purpose or use” or “conformance to requirement” or ....., and it is this which forms the cornerstone for all other systems such as TQM. This journey to understanding starts with ISO 8402, through the ISO 9000 series which are used as tools in understanding how implementation and eventual accreditation helps to promote and achieve this goal.

South Africa is very weak in terms of supervisory leadership. It is important that a great investment in terms of time, effort and money should go into the development of middle management and supervisory leadership. These two levels of management have to be mobilised before mobilization of the workers, otherwise they will be marginalised and alienated.

The improvement of quality in products and service should become national priority. There is the conception that quality begins with the understanding that only customers (internal and external) can define quality. However, quality management is not strategy, it is a new style of working/thinking – a dedication to quality and excellence.

The first and most critical element of TQM is leadership and support from top management. Top managers must be involved in establishing an environment that encourages change, risk-taking, pride in work and continuous improvement on behalf of all customers.

The most important and critical ingredient (after management responsibility) to achieving a quality commitment throughout an organisation, is employee involvement, empowerment and teamwork, i.e. participative management.

## **5.6 Role of management**

The total quality concept can not be implemented if the process is not driven by the chief executive officer and supported by top management. Unless senior management is fully committed to the idea of real improvement in quality, it will be impossible to motivate the rest of the organization. The role of top management thus needs to be accurately defined. Total quality does not stop at management level though, it encompasses the whole staff and it is therefore necessary for the entire organization to undergo a cultural change.

Juran claims that less than 20 percent of quality problems can be attributed to workers and that more than 80 percent is attributed to management. Deming

goes further, with astonishing precision, he claims that management is responsible for 94 percent of quality problems. There are far more opportunities for making errors in planning activities (or not), in measuring the wrong parameters, in failing to take appropriate action on the findings, than simply doing things.

Failures in the past has been accredited to:

- Lack of creditability: management does not practise what they preach.
- Lack of clear, measurable goals e.g. “do your best” and “improve”.
- Lack of guidance, tools and methods (no training in problem solving).

When the workforce fails to respond, it is claimed to have an “attitude” problem. In all likelihood, this problem exists in management and the root cause of the problem must be eradicated here. The best way to motivate employees is directly. A successful program adopted from the Japanese are quality circles which both strive to motivate the workforce and create a culture of zero defect.

Managers have long been stuck to cause-and-effect styles of management i.e. appointing staff to certain duties and responsibilities and providing core or support activities to the most cost effective manner possible. External factors affecting the business would generate the need to change internal processes. Measurement and gauging of these effects would, in itself, be another process, as would be the requirement to give business its overall strategic direction. Any deviation from the ideal would then be cause for concern to which managers would respond. Some of the conventional management styles are as follows:

- The perception that quick decisions are a measure of successful management;
- Lack of understanding of variability in current processes;
- Failure to co-operate across functional boundaries;

- Firefighting (dealing with symptoms) rather than searching for the root causes of problems;
- A widely-held view of subordinates as individuals who makes mistakes, rather than as victims of processes which lack robustness;
- Appraisal systems which measure an individual's failures primarily as indicators of his performance, rather than as indicators of the weakness of the process;
- Appraisal systems which reward individual performance, rather than dividing the rewards of improved business performance resulting from the individual behaviour in a team effort;
- A reluctance by staff to propose improvements to a process or to highlight their own failures in a poor process (fear factor); and
- A reluctance by staff to communicate across functional boundaries at their own level, if parochial constraints are evident at higher levels (fear factor).

Over long periods of time, these behaviour patterns became the accepted norm for managers.

In simplistic terms, the new role of management is the opposite of the pattern described above. The present culture of the business has been formed over many years and to some extent has been mirrored throughout the sector. Such comfort therefore creates considerable inertia and resistance to change. Total quality is not simply a framework for improving business performance but represents a fundamentally different way of operation, one which challenges management's traditional role and demands commitment from management at all levels. Given that commitment, evidenced by the changed behaviour of management, the commitment of employees can also be sought.

It is claimed that without commitment from the top, the success of any given project or venture is doubtful. The secret is to do basic things well and to get good results which will act as the catalyst that breeds success and commitment. If the process of continuous improvement is to be successful and sustainable, it is important that top management demonstrate leadership

and commitment. The vision developed at this level must be believable in every layer of the organization. It must be exciting enough to move the team to action, attainable so it does not lose spirit, provide for continuous quality improvement, keep the customer in focus and provide direction towards the goal.

Middle management are the watchdogs of the organization i.e. they function in a supervisory capacity to ensure quality, to set priorities and to develop staff. In a total quality company, that role is broadened to include responsibility for the continuous improvement of every aspect of the process under his/her control.

Their roles are:

- Involving the people that work in the process;
- Co-operating across functional boundaries;
- Eliminating fear.

This role requires that managers:

- Develop and publish clear documented corporate policies and objectives;
- Develop clear and effective strategies and supporting plans for achieving these objectives;
- Understand the nature of failure and current levels of correction and prevention activities;
- Treat subordinates as victims of poor processes and measure employees' failures as measures of their own failure to reduce variability in the process;
- Tap into their subordinates' detailed knowledge of each part of the key process;
- Encourage effective employee participation; and
- Use their authority to change the processes under their control.

This involves drawing employees into the improvement process. This is only possible if people:

- Understand what services they provide to an internal or external customer;
- Understand how well they have to provide those services;
- Believe that they are empowered and actively encouraged by the business to alter the way in which they work;
- Feel that the business is free from inter-functional conflicts and parochialism;
- Feel that their manager is receptive to new ideas.

While there are many criteria for the success of quality improvement, these are almost wholly determined by the behaviour of middle management.

Another important change agent is the chief executive officer (CEO). Unless the CEO takes the lead in a process of quality improvement, all attempts or improvements made by individuals and departments will only be transient in nature. In the majority of cases, CEO's will not be the sole trigger; they are more likely to be one of a combination of forces (typically with either or both competition and demanding customers).

A number of organizations adopted the concepts of TQM and made use of a number of tools developed to facilitate its implementation. However, in many instances, the initial surge in enthusiasm died out relatively quickly, one of the main reasons cited as being the CEO did not actively support the drive towards TQM. It should be understood that TQM is a top-down management process and that unless management directs or drives the process, any attempts to make it work, will fade out with time.

Another approach is for an organization to assimilate and then adopt the writings and teachings of one of the internationally recognized quality management experts (Crosby<sup>23</sup>, Feigenbaum<sup>52</sup>, Juran<sup>12</sup> and Deming<sup>11</sup>) and to follow the advice and methods propounded by the chosen expert. The rationale is that this approach provides a coherent framework and gives

discipline to the process. The ways of approaching quality management as suggested by the four gurus are but variations on a single theme, the essential difference being the focus of their approach. Broadly speaking, their teachings can be characterized by the main focus of their approaches, as follows:

Crosby:	company-wide motivation
Feigenbaum:	systems management
Juran:	project management
Deming:	statistical process control

The teachings of these quality management experts have four points in common:

- The importance of top management support and participation.
- The need for workforce training and education.
- Quality management requires careful planning and a philosophy of company-wide involvement.
- Quality improvement must represent permanent, ongoing activities.

Although the above four experts are recognized as being modern forefathers of quality management, the contributions of Japanese experts such as Ishikawa and Taguchi should not be underestimated. Through their contributions, Japanese total quality control includes now familiar concepts such as:

- listening to the voice of the customer;
- commitment to improvement and perfection;
- elimination of waste; and
- insistence on compliance with the procedures and correction of one's own errors.

"If a company's management sets a standard of zero defects, it does not mean that it does not expect any defects, only that it will not be satisfied with having defects, however few. As each error is recognized, steps will be taken to eliminate it. It is the workforce's realization of this management attitude which motivates its own efforts to assist. Crosby<sup>23</sup> sees the zero defect process as consisting of 14 stages:

Juran's method for implementing an annual improvement plan

1. **Formulate a Quality Policy.**
2. **Assess the most important aspects of quality** i.e. cost, effectiveness and profitability.
3. **Determine the organization for and establish a project system** through attraction and encouragement of participants.
4. **Assign responsibility for the successful completion of projects.** Ownership can not be over-emphasized.
5. **Identify training needs.** The more informed they are the better the participation.
6. **Identify those who should be trained.** Facilitators – leaders – members.
7. **Schedule training.**
8. **Determine the support required by the teams.** At the initial stages, assistance is more intensive, however, time must be allocated to work on projects.
9. **Provide co-ordination.** Regular meetings with facilitators, leaders and members as well as progress reports.
10. **Initiate new measures.** Identify and promote new projects.
11. **Review performance criteria.** To monitor success/improvements.
12. **Design a publicity plan.** Recognition through award ceremonies or company bulletins of successfully completed projects.
13. **Actions recommended for top management.** Examine and approve the policy – authorize the organizational infrastructure: quality committees, project systems, roles, responsibilities, training schedule, assistance to teams, co-ordination plan, publicity plan – examine and approve modifications in improvement charts, in the performance criteria system – examine progress reports – participate in projects – participate in training.
14. **Start all over again.**



Thus, given the will (step 1), the following steps relate to the setting up of a team, finding the facts and preparing the workforce. After the team has been 'run in' and the ground prepared, steps 7 onwards are 'team executions' implementing the drive to zero defect.

## **5.7 TQM tools and techniques**

Total quality management is a company-wide continuous improvement process that involves everyone, not only in the solution of problems but also in their prevention. The development of quality management has been presented as an evolution from inspection, to quality control, to quality assurance.

A central concept in the overall philosophy of total quality management is the prevention of quality problems (and their attendant costs) as opposed to the more traditional concept of detection and correction. Planning for quality and learning from the causes of today's improvement projects are the keys to prevention. Fortunately, there are several tools and techniques to aid the process.

In many of the techniques, the emphasis is on teamwork and participation, each team member contributing to his/her own specialist knowledge during meetings and carrying out assigned or agreed tasks between meetings. Teamwork results in improved communication, motivation, analysis and problem-solving capability and the development of collective responsibility. Teams can be either cross-functional task forces created by senior management or teams working autonomously on day-to-day departmental issues (the quality circle concept).

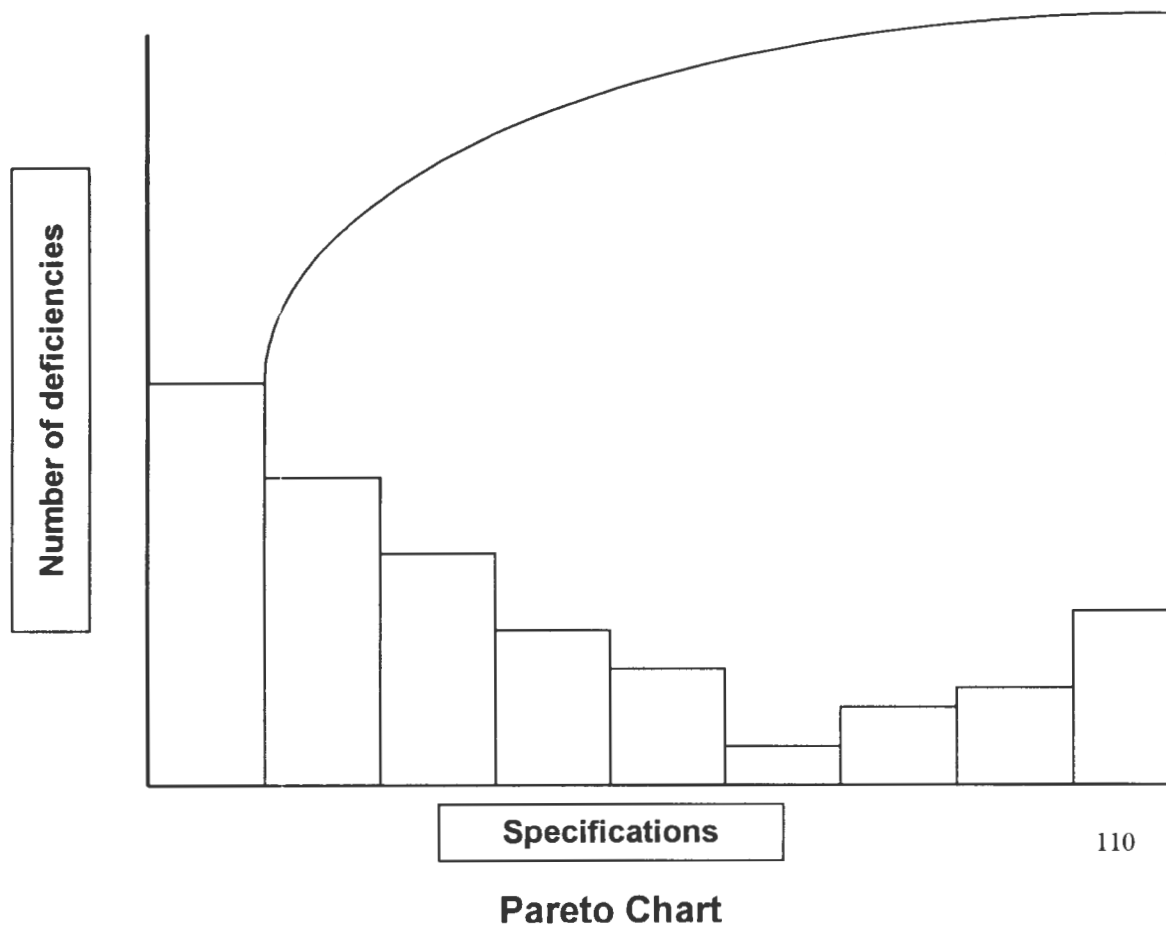
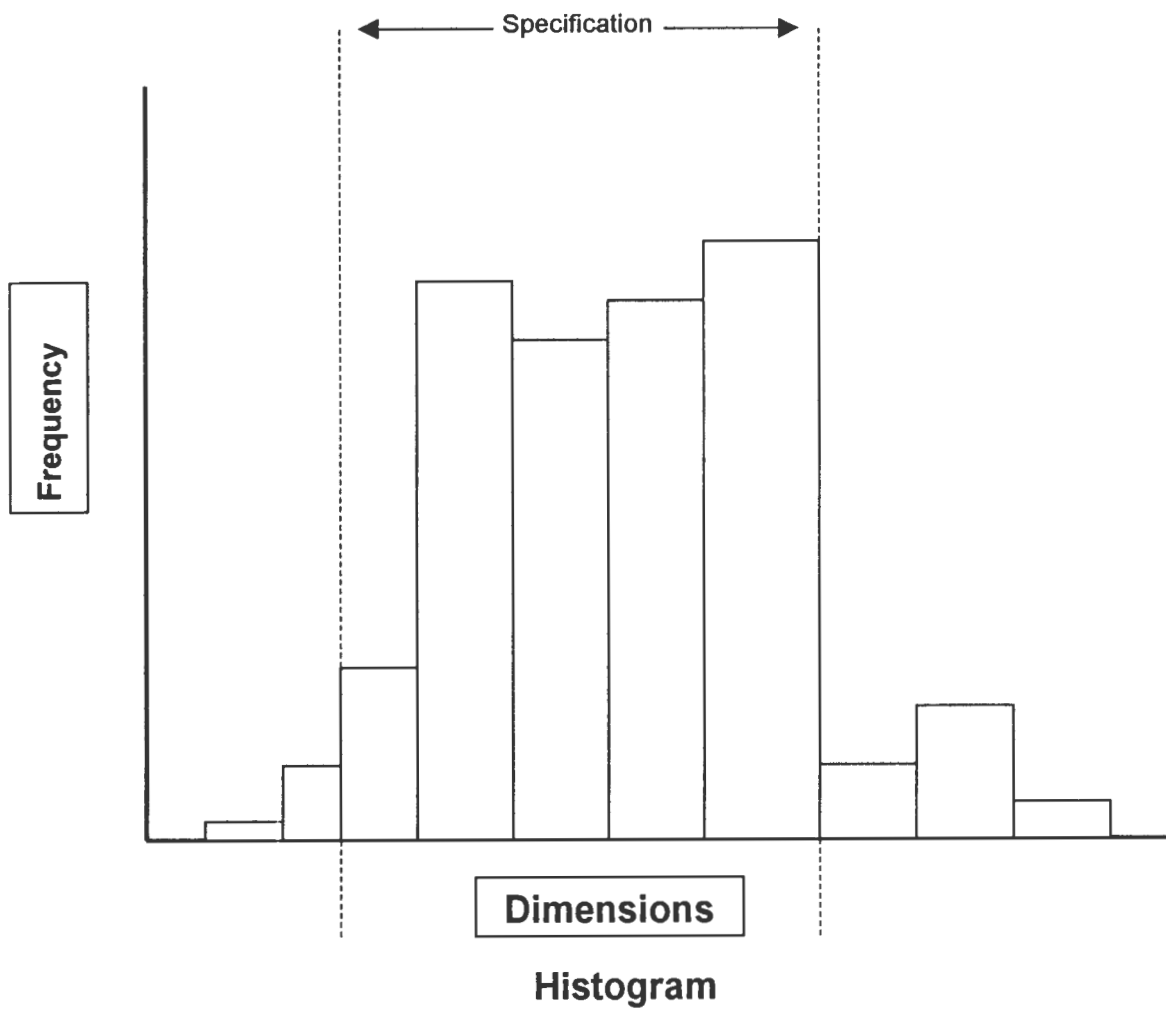
### ***5.7.1 The seven (old) tools of quality control***

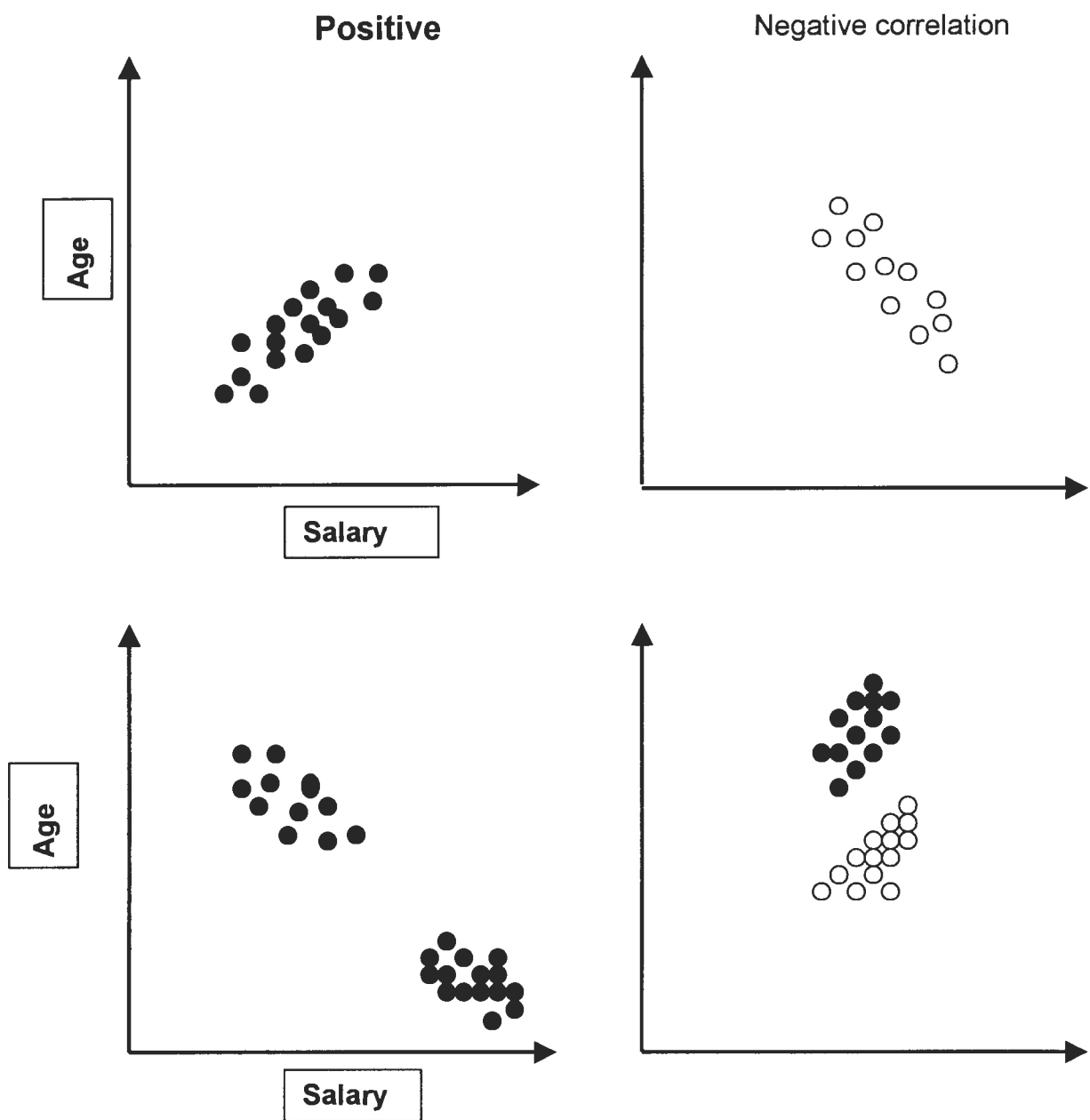
These are the tools championed by Dr Ishikawa and which have been used so effectively by Japanese companies since the early fifties. They are used by everyone in the organization. Data are collected and displayed in simple,

visual formats; everyone speaks the same language and there are no misunderstandings.

The seven old tools are used to evaluate current performance, to make improvements to it, and then to control the process at the new level. The whole circle is then repeated: continuous improvement. The tools are used in the teamwork environment and everyone is trained in their use. The seven basic tools are:

- Cause-and-effect diagram
- Check sheets
- Histogram
- Stratification
- Pareto charts
- Scatter diagrams
- Control charts

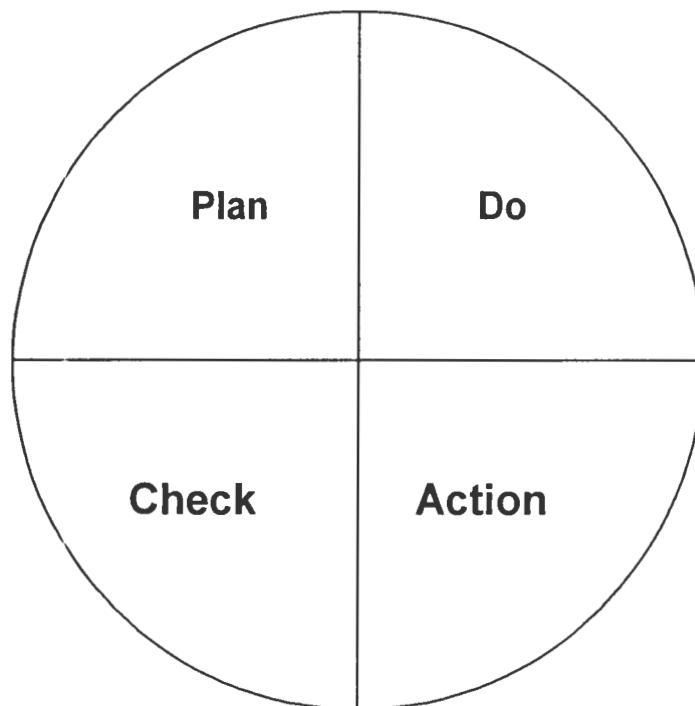




**Scatter Diagrams**

5.7.2 *The Deming cycle* - the Deming (or Shewhart) cycle was introduced to Japan by Dr E Deming in the early fifties. It is also known as the plan-do-check-action or PDCA cycle and involves a simple feedback loop. It is an ideal technique for linking together the easily learned problem-solving tool, as a continuous improvement process.

The technique is used to counter the often-used process of leaping before looking. The plan stage involves a full investigation of the problem (data collection, analysis and then proposal of solutions using the above mentioned tools). The do stage involves a trial, implementing the proposal stage, preferably on a small scale. Check means to monitor the trial and observe the results of the change (again, perhaps, using the seven tools). Action, the final stage, is decided upon as a result of the assessment of the trial.



**The Deming Cycle**

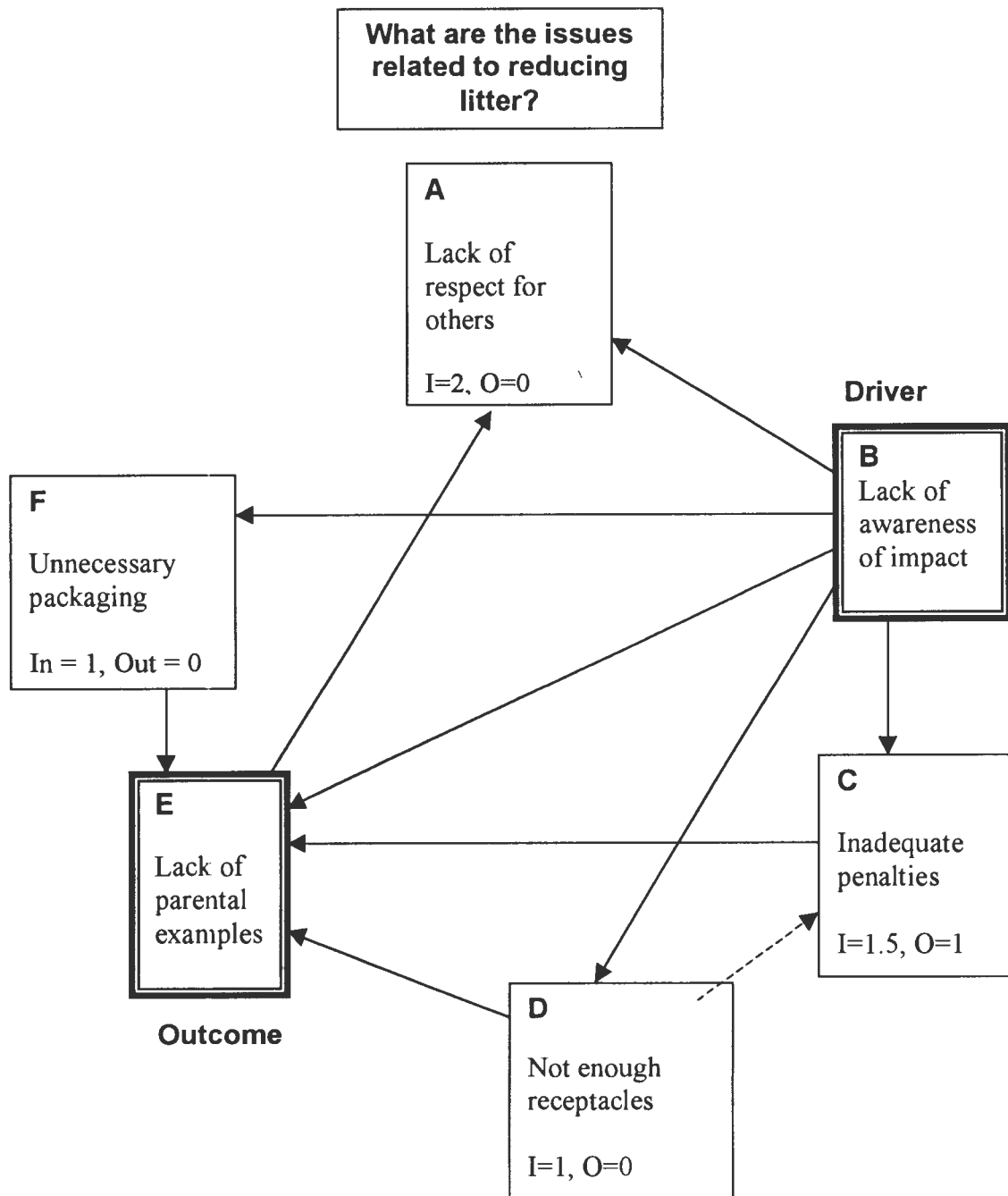
*5.7.3 Statistical Process Control (SPC)* – is probably the method most used in the western world for controlling the quality of a process. As a determinant, SPC is used to determine control limits for the production process in order to produce products at the specified level of quality. As a controlling instrument, it gives a statistically determined indication of how the total process is running and whether it is producing conforming outputs or not. The information can then be used to control the process immediately and thus prevent non-conforming output.

#### *5.7.4 The seven (new) tools of quality control*

These newer tools for quality management go beyond the original seven tools, both in complexity and in depth of analysis. They are, however, still used in a team environment and people from different levels and functions can often contribute. However, the seven new tools are usually looked upon as management tools. With the exception of the matrix data analysis, the seven tools address verbal rather than numerical data and they are used mainly for improvement projects. Like the seven old tools, the seven new tools are often used in combination to get the best results. The seven new tools are:

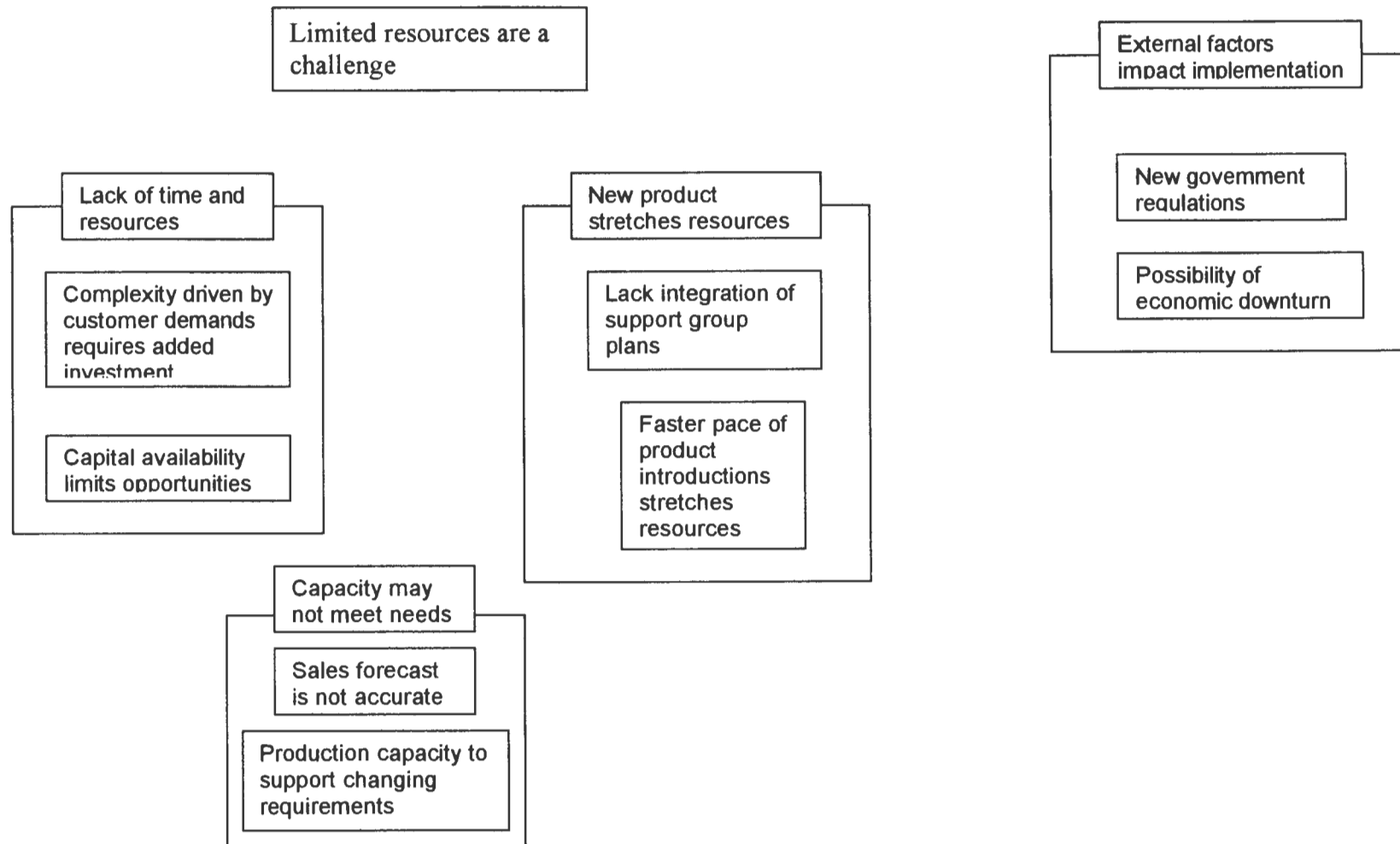
- 5.7.4.1 Relation diagrams – these diagrams are a more detailed type of cause-and-effect analysis, used when the causes have complex interrelationships.
- 5.7.4.2 Affinity diagrams – provide order to verbal data by organizing them into similar categories. They offer a visual display of ideas and information, which helps to analyze and clarify issues.
- 5.7.4.3 Tree diagrams – are used to systematically map out the activities which must be undertaken in order to reach a desired goal, step by step.

- 5.7.4.4 Matrix diagrams – are used to evaluate relationships between different characteristics and to establish their relative importance. One set of ideas is listed along the vertical axis and the other set is listed along the horizontal axis. The matrix provides the structure for systematically evaluating the relationship between the two sets of ideas.
- 5.7.4.5 Matrix data analysis – this technique is applied to large matrix diagrams to provide results that are visually acceptable. The symbols are converted to numbers and the large arrays are usually evaluated and displayed by a computer.
- 5.7.4.6 Process decision program chart (PDPC) – is used for process optimization and error prevention. It uses the tree diagram and evaluates the proposed process, step by step, to anticipate problems and make plans to prevent them. Each major branch is taken in turn and the following questions are asked: “What could go wrong at each step?” and “What other path could this step take?” The new direction is drawn onto the diagram. Preventive actions or countermeasures are listed for each step.
- 5.7.4.7 Arrow diagrams – are a flowcharting process used for planning and scheduling. They are similar to Gantt charts. The tasks necessary to complete a job are listed and the probable time is required for each task is estimated. The tasks are arranged in chronological order.



Relation Diagram





**Affinity Diagram**

Secondary

Means

Primary  
Means

*How?*

*How?*

Objectiv  
e

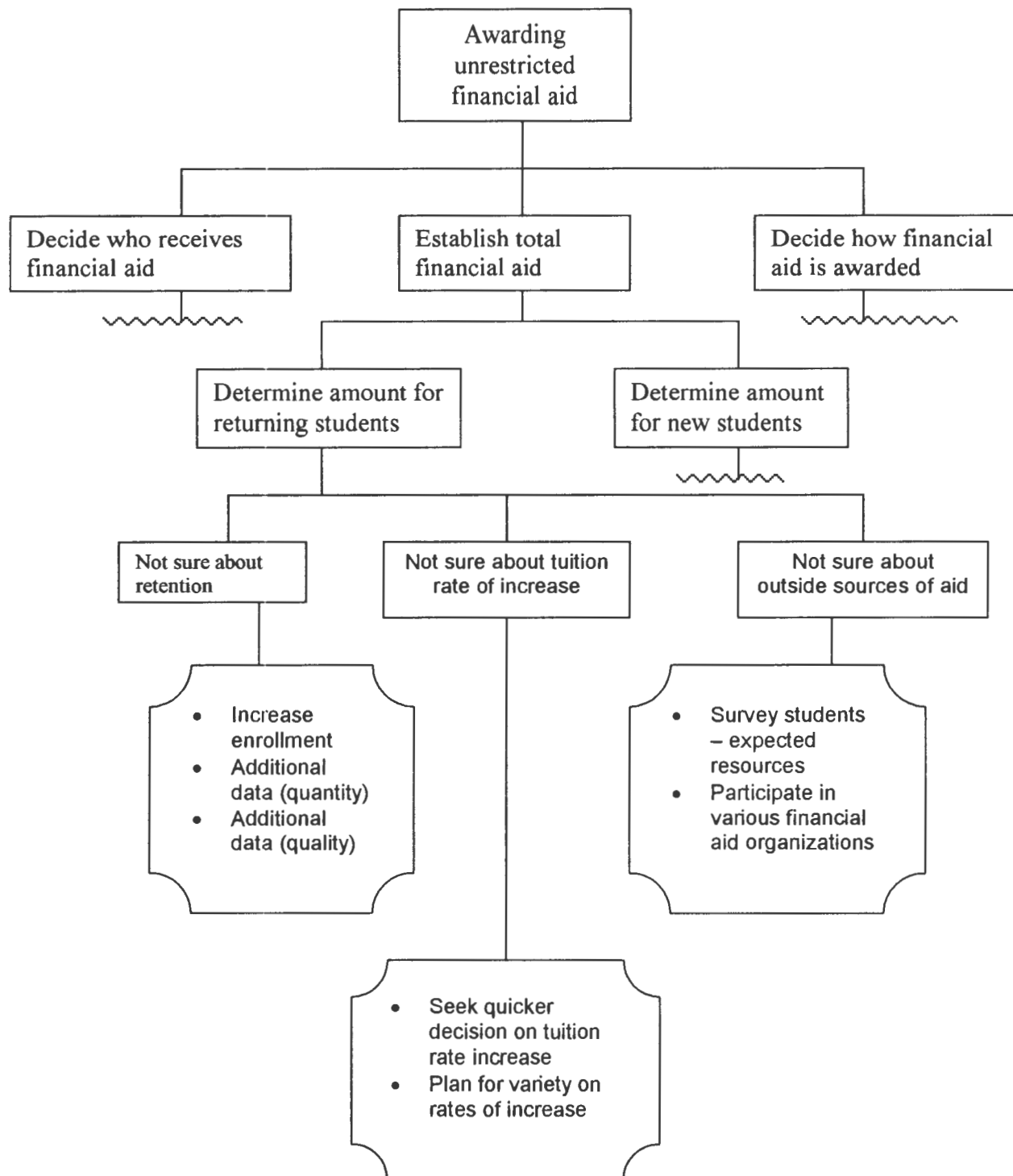
*How?*

The Tree Diagram

		1	2	3	4	5	6
	A						
	B						
	C						
	D						

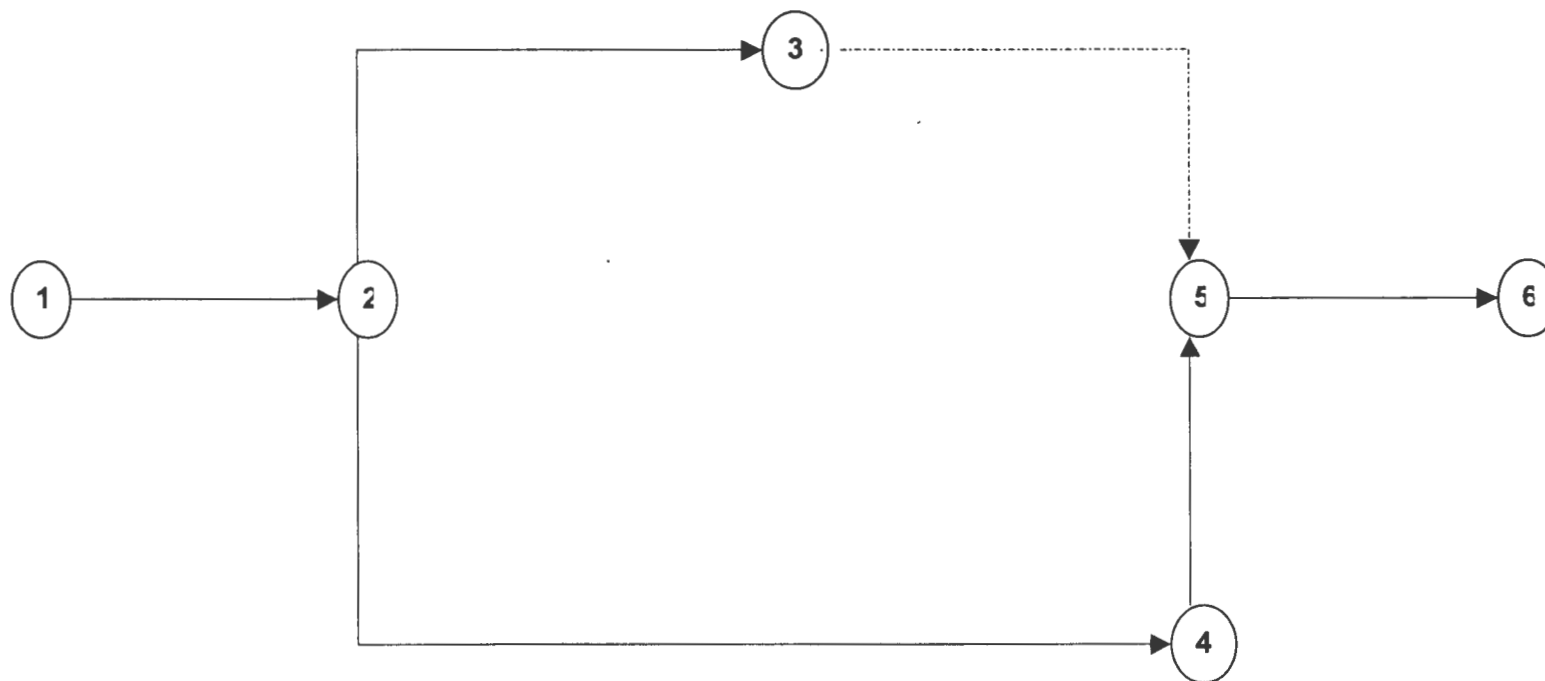
■	Strong influence
◆	Possible influence
•	No Influence

**Matrix Diagram**



**Process Decision Program Chart (PDPC)**

○	Node for beginning or end of an event
→	Activity
---→	Activity not affecting time



**Arrow Diagram**

## **5.8 Employee participation**

Total quality means the active participation of all employees. This approach involves everyone working together to improve processes, and so harness the commitment of the whole workforce to quality in all its forms. This type of approach is high-risk and high-return. It is intended to capture a very large number of (mostly minor) ideas from employees which add up to a substantial benefit. Because the ideas are generally easy to implement, employees see improvements happening very quickly. They also see that the organization is truly committed to improving quality in all forms. This creates credibility and builds momentum.

However, approaches like this require very careful project management. As the process involves everyone, the effects of failure are visible to all. There is also a risk of reversion to business as usual at the end of the first stage. It is important that the company-wide approach be followed by another initiative. This could be further training, or the establishment of quality improvement teams or even quality circles. A streamlined organizational structure is thus required for quality improvement, based on:

### ***5.8.1 Training***

Total quality performance is about the balancing of all resources (people, systems and technology) to optimum effect so as to maximize customer satisfaction; not just in terms of products but also in terms of being the kind of company with which the customer would prefer to do business. Human resources drive both the systems and technology in companies and provide the link between them. It is human resources that provide the greatest scope for total quality improvement. Total quality performance promotes improvements through people, using systems and technology to support what they do.

Training needs will increase together with the growing complexity of the technological, economic and social environment. Companies should recognize this fact and considerable investments not only in quality training,

but also in professional training: the two are inseparable. Training in methods for resolving problems, in management tools and elementary statistics is accomplished through group motivation and pedagogy.

Education and training can be effective in starting to win hearts and minds, but unless it is coupled with a structure which draws people together across functional boundaries to resolve problems, it will invariably inspire more cynicism than progress. Personal development requires self-awareness and self-improvement. The discovery of self is made in concert with others and through others. Quality control circles and quality improvement groups become powerful tools for detecting needs and potential capabilities.

#### *5.8.2 Quality circles*

Quality circles are defined groups of four to twelve people, coming from the same area, or environment, performing similar work, who voluntarily meet on a regular basis to identify, investigate, analyze and solve work-related problems. The circle presents their solutions to management and is usually involved in their implementing and subsequent monitoring. Through these meetings, understanding of the various jobs is deepened, better human relations and leaderships are established and the members' participation-consciousness and fellowship-consciousness are highly developed. Furthermore, the ways to solve the problems by using quality control techniques are rightly understood by them.

The purpose, however, is not employee satisfaction, but to solve quality problems. It is a pragmatic attempt to create an environment in which any member of the organization can be co-opted in to the problem-solving activities and their special knowledge and insights used, especially through:

- Top management support
- Training
- Provision of resources
- Delegation of responsibility
- Credit for achievements

To flourish and be successful, circles need:

- Top management support, so that the circle has credibility both among its staff and among outsiders;
- Truly voluntary participation, letting people join, abstain or leave without being under any pressure;
- Specialist support at the start-up phase e.g. from a quality circle consultant;
- A quality circle facilitator, who is trained in-house and can provide advice, mobilize resources to help the circle, co-ordinate the activities of existing circles and help new circles to get started;
- Operational support, providing time and facilities, advice, interest and co-operation;
- Training in problem-solving techniques, in running meetings, in presentation skills, and in any relevant skill area where the circle feels itself to be weak;
- Recognition of their work, by being allowed to implement their recommendations, and by acknowledgement by management to the workforce at large, of their successes.

The following constraints are usually placed on quality circles:

- Circles deal only with problems whose solutions lie within their own control.
- Circles will not address issues of pay, disciplinary matters, personality clashes, etc.

## **5.9 TQM Implementation**

As mentioned on various occasions, it is important that when an organization wishes to develop and implement a total quality program, it has the full



commitment and involvement of top management in order to set an example as well as give some credibility to the proposed course of action. A TQM manager must be given the authority and responsibility of ensuring that the implementation process is duly followed according to the quality plan of the organization. Regular reports identifying the status of the process must be made and retained.

The second condition is to ensure that the environment in which this program will be implemented is not hostile as this would make the process difficult or nigh impossible.

The existence of an ISO 9000 or 14000 system or accreditation goes a long way in making implementation of TQM a whole lot easier as the mindset of the organization has already been determined.

There are several organizations and models/frameworks that proposes a sequence of action to be followed in order to implement total quality management within companies. Examples are those of Juran, Crosby and others but the most common points in all are:

- the involvement and commitment of top management,
- setting a good example,
- individual or collective participation from everyone in the organization,
- assigning responsibility for the project,
- co-ordination and training.

A summary as provided by Verhaeghe<sup>53</sup> (1994) for implementation is as follows:

- understanding quality,
- commitment to quality,
- policy on quality,
- organization for quality,

- measurement of cost of quality,
- planning for quality,
- design for quality,
- control of quality,
- training for quality,
- implementation of TQM.

These points above are merely to serve as guidelines towards implementation and do not necessarily mean that the sequence should be strictly adhered to.

# CHAPTER 6

## APPLICATION OF TQM TO URBAN MANAGEMENT

### 6.1 Introduction

It is the purpose of this chapter to demonstrate the following:

- The base that has been established in the previous chapters particularly through Chapter 3: “ISO 9000 + 14000 series on Quality Assurance” and Chapter 4 “Urban Management per se”, is that Quality Assurance will significantly move an organization towards a successful TQM programme.
- The implementation of a TQM programme WILL have significant benefits to the management of an organization and particularly improve the efficiency and effectiveness of that organization.
- The implementation of TQM shall improve service delivery and subsequently customer (public) satisfaction.

After all, TQM is about how organizations perform work, satisfy customers, service delivery, get better at what they do, and – perhaps more important of all – how they inspire, reward and impress various stakeholder groups.

Customer satisfaction is the best measure of quality, and in public projects, “customers” are the users, owners, and other individuals or groups whose interests are at stake. As a result quality in public projects depends on the project team’s thorough understanding of the project and its goals; a structured plan to achieve those goals; an understanding of everyone’s role in the project team; and an established communication network to share information.

It is postulated that the approach to a successful TQM programme must necessarily follow a two phase process. The first phase can generally be termed as being the mechanistic approach where the key elements that the

ISO series provides form the basis of a quality system. The procedures and processes expressed therein are well documented but must be tailored to the needs and requirements of the organization and in that aspect is therefore not prescriptive.

The second approach would be the application of a total quality management system to urban management. But before that can proceed, it must first be established whether there is a need and a want to implement such a programme. The benefits of TQM have been highlighted throughout this document and the need within urban management has been established based on inefficiency, poor service, lack of participation, degradation of the environment, fragmentation of structures and poor quality of city life.

This chapter examines each of the previous chapters separately and extracts the salient points necessary to substantiate the original hypotheses i.e. the implementation of a TQM system is necessary within the urban management sector but through its application will greatly improve the operations of the local authority.

## **6.2 History of Quality**

This chapter traces the evolution of quality from the individual craftsman through the Industrial Revolution to the way quality is perceived in our modern society.

In its earliest form, quality as practiced by the individual craftsman, is essentially using his own means of evaluation of the product he has manufactured, in other words applying his own value system. This value system would extend from the materials that he uses, inclusive of the tools used in manufacturing, the use of skilled labour culminating with the finished product. Once the craftsman is satisfied with his product does he make it available at the marketplace for purchase. There were no records or documents to identify these processes nor to demonstrate the skills

necessary. In most cases, the craftsman would use his own descendents or failing this, select a suitable young person who would then be trained over a number of years, learning the trade. The skill is effectively passed on from father to son.

Once the manufactured goods are displayed at the marketplace, another value system takes effect – that of the buyer. However, the village marketplace became an arena of extreme competitiveness as now many craftsmen had the opportunity to exhibit their goods, each needing the trade to make a living. It was important therefore to trade with goods of exceptional quality which would result in further trading at the next opportunity and in the process build up a reputation for that craftsman. It was therefore up to the buyer to supply a crude form of quality assurance to measure each product with the other. This forced the buyers to be vigilant so as to protect themselves against poor quality. In effect, the craftsman was responsible for supplying the goods but the buyer became responsible for supplying the “quality assurance”. This arrangement became known as the doctrine of caveat emptor – let the buyer beware. This situation demonstrates the need to satisfy the requirements and/or specifications of the customers.

The Roman Empire was highly centralized (the marketplace) but with the advent of Industrialization and countries like Germany, Britain and Russia participating led to the demise of the early value system described previously. In this age it was all about mass production and marketability. However, problems of standardization and interchangeability were rife as many manufacturers competed for their own piece of the marketplace and quality suffered. The revolutionary nature of mass production required adoption of methodologies beyond those employed by the craftsman. These new methodologies in effect consisted of three revolutions – revolutions in technology, in business management and in statistics.

These developments completely changed the work environment and as a result quality got “lost” along the way. Some of the changes required more

skilled workers and a lesser demand for unskilled workers as well as declines in the quality of work life due to the monotony of tasks.

In order to revive the quality concept, many industrialized countries brought in "national standards" to rationalize undue variety and to provide interchangeability. New laws emerged to protect consumers; other laws were enacted to protect trademarks. Examples of these standards still operational today (in revised format) are British Standards Institute (BSI) and Deutscher Normenausschuss (DNA).

The Japanese success story renewed the drive for quality and was spurred on by the two quality experts i.e. Juran and Deming each advocating separate approaches to quality but both achieving the same goal – awakening the quest for quality. This quest was further supported through involvement of the international standards as managed by ISO.

Where previously, during the industrial revolution, quality issues were removed from the individual and responsibility was placed on the manufacturer or organization, appears to have revolved back to empowering the employee. One of the supports of total quality management is the involvement of all employees (employee participation) who through their own contribution, could affect the quality of the final product or service. It now appears as if the wheel has gone full circle where the value system once again begins with the individual - whether craftsman or employee, skilled or unskilled and their contribution towards quality.

### **6.3 ISO 9000 + 14000**

The ISO 9000 and 14000 series forms the stalwarts of a good quality system and leads eventually to an effective total quality management framework. The International Standards in the ISO family are intended to provide a generic core of quality system standards applicable to a broad range of industry and economic sectors. They describe what elements quality systems should

encompass, but not how a specific organization implements these elements. It is not the purpose of these International Standards to enforce uniformity of quality systems as the needs of organizations vary. The design and implementation of a quality system must necessarily be influenced by the particular objectives, products and processes, and specific practices of the organization.

The quality of products/services depends on how the company is managed and what sort of control is exercised over all activities concerned in the design, manufacture, inspection and other activities which affect quality. Companies should use a system to achieve control of quality. Such a system is identified in most countries by the term "quality system". A quality system consists of a group or list of guidelines and disciplines that together are aimed at gaining satisfactory quality levels in products/services. It is the documenting of experiences, well tried over preceding years, and is also a valuable tool in the search for improved performance i.e. greater efficiency through more efficient production, less wastage and better customer satisfaction.

#### **6.4 Total Quality Management**

TQM is a way of managing to improve the effectiveness, efficiency, flexibility and competitiveness of a business/organization as a whole. It is a complete departure from the traditional trap of concentrating solely on inspection and testing to find and eliminate failures. Instead, it involves whole companies getting organized and committed to quality at each department, each activity, and each person, at each level. TQM recognizes that, for an organization to be truly effective, each of its parts must work smoothly with the other parts, because every person and every activity affects and in turn is affected by others.

The techniques of TQM can be applied throughout an organization so that people from different departments, with different priorities and abilities, communicate with and help each other.

TQM is not simply a cost-cutting or productivity improvement device and it must not be used as such. TQM is concerned chiefly with changing attitudes and skills so that the culture of the organization becomes one with preventing failure and the norm that of operating right first time.

Systems and techniques are important in TQM but they are not the primary requirement. It is more an attitude of mind, a culture based on pride in the job (a return to the days of the craftsman taking pride in their work) and requiring total commitment from management, commitment which must be extended to all employees at all levels and in all departments.

Customer-based quality is a continuous process of repeatedly tuning in to the customers' wants and needs, developing ways to respond to them more effectively, and then assessing how well an organization has performed and how satisfied customers are with its services. Establishing a focus group technique is a useful tool at each phase of the cyclical process of a TQM. It is especially helpful in a quality improvement cycle, because a department or organization can be in direct touch with its customers and get early input from them on their requirements and expectations. The organization can use this information to help decide how best to make its facilities, services, and plans responsive to customer i.e. the 'stakeholder' needs. Likewise, at the end of a quality improvement cycle, focus groups can provide feedback on the extent to which customers think their needs have been met, along with remaining gaps where additional improvements are in order. During the middle of a quality improvement cycle, focus groups give information that can be used to make mid-course corrections.

The information gleaned from focus groups is used in an organization in a variety of ways in a quality improvement process. Questions that can be answered in a focus group are:



- What do our customer want and need?
- Do different sets of customers want or need different things?
- What do they expect of an organization in terms of quality of service?
- How well do they think an organization has met their needs?
- What do they need in the way of more, less, better, or different performance from an organization to be satisfied customers?

Customer information from focus groups is used in a variety of quality improvement functions, including ones oriented to external and internal customers. It is used to help frame goals, criteria, and desired outcomes in such functions as these:

- Developing and tracking performance measures for the local authority as a whole, for departments or activities, and for individuals;
- Developing staff training and skill improvement programmes;
- Planning budgets and other resource allocations;
- Identifying policy and programme changes to better meet customer needs;
- Developing service delivery policy process improvements and protocols;
- Formulating plans, alternatives and impact mitigation measures;
- Modifying customer information and public relations programmes to better inform users of the organization's services, facilities and performance;
- Providing feedback and verification on the quality of the organization's performance, both internally and externally to all the stakeholders

## **6.5 Urban Management**

The city can be seen as a system and urban management provides the basis for the management of that system in a manner, which seeks to provide an equitable and sustainable future for the city and its residents (Abbott 1996).

The typical city administration is faced with the task of promoting economic growth so as to raise the living standards and trying to improve the delivery of infrastructure and services. This is done to avoid permanent damage to environmental resources in and around the urban area.

Cape Town and other large cities in South Africa are currently hotly debating the Megacity concept and are therefore fairly prevalent given the current developments within the city. It is envisaged that the Megacity concept will combine theory and practice in the search for successful approaches to improving urban management and the conditions of daily life in these large cities. The approach is based on collaboration between government, businesses and community leaders in trying to find a deeper understanding of the process of innovation and the consequences of social change whilst simultaneously developing and uplifting those communities involved.

However, as highlighted in Chapter 4 on Urban Management, the process leading up to the possible implementation of the Megacity concept requires drastic evaluation. Largely due to the current issues of fragmentation within governmental structures, poor service delivery and lack of community participation as a start.

It is for this reason that the implementation of TQM, with its comprehensive and strategic management philosophy based on continuously improving quality and customer satisfaction through participation of all stakeholders can have enormous benefits to the city and its inhabitants in general.

If ever there was a golden opportunity for implementation of TQM, it certainly would be now since the evolvement in the cultural and attitudinal changes brought about by TQM will make understanding and upliftment a natural process. This can be achieved without raising any suspicions from stakeholders as they would then form part of and contribute to the changing environment.

## 6.6 Starting a TQM System

It is important before any system or change in an organization is implemented or developed that the organizational environment is considered. The environment must be open to change, as a hostile environment will make implementation of a TQM difficult or impossible. It is therefore important that a customer-driven quality system be built upon core values of leadership, commitment, full participation of all concerned and continuous improvement. To ascertain whether the organization will accept a TQM, one could ask a number of questions i.e.

1. Is the organization's senior leadership committed to TQM?
2. Is there a commitment from management towards implementation of a TQM system?
3. Is there a company wide awareness of TQM?
4. Are there current quality systems in place?
5. What is the perception of the customers regarding the performance of the organization with respect to quality?
6. What do we hope to achieve through implementation of a quality system?
7. Where are we currently on the road to the achievement of quality?
8. Are there quality systems currently in place?
9. Is our organization willing to put forth the effort required to achieve quality?
10. Are there assets available to launch a quality programme?
11. Does the organization believe in quality and its attainment?
12. Do we have or are we willing to acquire the training capabilities necessary for a solid quality programme?

Based on the work done in the previous chapters particularly Chapter 3 - "ISO 9000 + 14000 quality assurance" and Chapter 5 – "Total Quality Management", there are several methods of developing and implementing a TQM system. Several organizations propose a sequence of actions to be followed, most being philosophical in nature and apply to any organization whether manufacturing or service. Examples of these steps as defined in

Chapter 5 are the 14 steps of Crosby or the 13-point strategy as proposed by the Juran Institute.

These mentioned are a few clear examples, whose common points can be noted i.e. the involvement and commitment of top management, the participation of everyone, both individually and collectively, the determination to use measurement to achieve progress and setting of a good example.

Based on the above, the implementation of TQM can be summarized as follows:

- Understanding quality
- Commitment to quality
- Policy on quality
- Organization for quality
- Measurement of cost of quality
- Planning for quality
- Design for quality
- System for quality
- Capability for quality
- Control of quality
- Teamwork for quality
- Training for quality
- Implementation of TQM

## **6.7 Conclusion**

This document has been a theoretical analysis of the processes leading up to and including a total quality management system but also partly examining the processes that this author believes to be the more relevant urban policy arenas currently lacking and in need of improvement. It would be interesting,

given the current debate on Megacities, the obvious and necessary changes in government structures that this will bring about and its similar objectives as that of TQM, to examine the possibility of co-implementation.

It is advisable to implement a TQM model gradually through individual process within an organization such as a large municipality as it would have more positive benefits than the implementation of a TQM model at one time across the whole organization

Local Authorities are bureaucratic in nature and do not easily accept change. Employees are firmly entrenched in their positions by the nature of the organizations and can stifle any form of change if they feel threatened. Therefore, change must come about slowly and with the co-operation of all. A definite benefit must be clearly visible for all to see. Employees must feel confident that change will better enhance their work environment, increase productivity and at the same time provide the same level (at least) of job security.

It is essential to target certain key personnel within the organization who it is felt, will have key influence over the implementation of some of the recommendations of a TQM model. If these key persons feel threatened, they could delay or even block any form of change. It is therefore important to find that "champion" within the ranks, contact them personally explaining the principles of TQM and how it would affect them. This must be followed by a training programme to facilitate the implementation of the TQM process within that individual department or office.

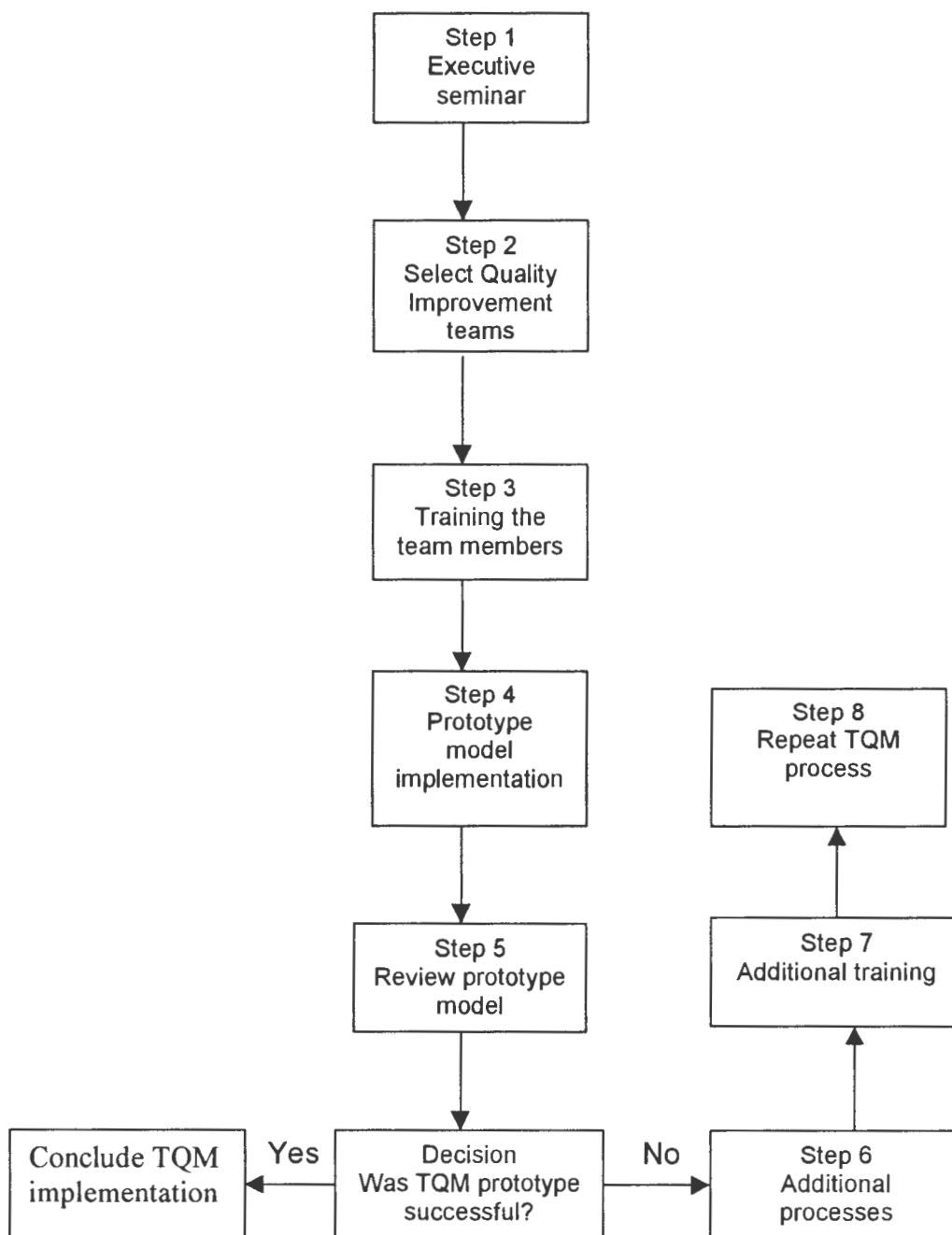
Fully involved people will be innovative and creative in furthering the organization's objectives. It is beneficial for the organization when people are satisfied with their job and are actively involved in their personal growth and development.

Behavioral change is probably the most critical area in the process of change. People do not necessarily resist change – they resist being changed. It is

important to give people time to understand the true needs and the process of change. Leaders promote open communication and a clear vision of the organization's future.

The stronger culture/values towards the market place, the less need for policy, instructions, organizational charts, etc. Leaders must empower and involve people to achieve the organization's objectives.

A possible prototype model for implementation within an urban management framework could resemble the diagram below.



## **6.8 Areas of further Research**

1. It is envisaged that the structure and implementation of a TQM prototype model conducive with the responsibilities and objectives of a Local Authority like the Cape Town Municipality, would ideally be a study in its own right.
2. This prototype must use the ISO 9000 and ISO 14000 series as a basis for creating a set of Quality Assurance procedures that through its generic essence, can be applied when finalized, to the entire operation of the Cape Town Municipality and with or without modifications, to other similar organizations countrywide.
3. The study should include identifying roles, constraints, resources, manpower, processes/methods, laws, regulations and policies as well as outside influences from other stakeholders, relating to the operation of the Municipality. The end result is to provide a methodology which will enable this organization to evaluate and measure its performance relating to service delivery and its other functions.
4. A survey instrument should be designed to solicit information and data from all individuals but particularly those individuals who are most likely to be knowledgeable on the topic of interest (Saraph<sup>6</sup> et al, 1989). This study will have to follow the lead of Flynn et al (Flynn<sup>4</sup>, 1994,1995) who propose that the perceptions of respondents at multiple organizational levels should be obtained in order to capture a broad spectrum of quality management practices.
5. The purpose of the sampling strategy is to collect data from all the employees of the organization, and a representative sample from its suppliers and customers (public).
6. Once all relevant information is gathered pertaining to the status of the current quality systems and the perceptions of its employees, a Total Quality Management prototype can be devised and implemented. An essential requirement, which must be stressed again, is the commitment from top management and the training of personnel in the concepts and practices of quality management.

## REFERENCES

1. ISO 9000:2000 Quality Management Systems – Concepts and Vocabulary
2. BURATI, J. L.; FARRINGTON, J. J. & LEDBETTER, W. B. March 1992a: Cause of quality deviations in design and construction. Journal of Construction Engineering and Management, ASCE, 118(1).  
  
BURATI, J. L.; MATTHEWS, M. F. & KALIDINDI, S. N. March 1992b: Quality management organizations and techniques. Journal of Construction Engineering and Management, ASCE, 118(1).  
  
BURATI, J. L. & OSWALD, T. H. October 1993: Implementing TQM in engineering and construction. Journal of Management in Engineering, ASCE, 9(4).
3. AHIRE, S. L.; GOLHAR, D. Y. & WALLER, M. A. 1996: Winter. Decision Sciences, 27(1).
4. FLYNN, B. B.; SCHROEDER, R. G. & SAKAKIBARA, S. September/October 1995: The impact of quality management on performance and competitive advantage. Decision Sciences, 11.  
  
FLYNN, B. B.; SCHROEDER, R. G. & SAKAKIBARA, S. 1994: A framework for quality management research and an associated measurement instrument. Journal of Operations Management, 11.
5. GRANDZOL, J. R. & GERSHON, M. 1997: Which TQM practice really matter: An empirical investigation. Quality Management Journal, ASQC, 4(4).



6. SARAPH, J. V.; BENSON, P. G. & SCHROEDER, R. G. 1989: An instrument for measuring the critical factors of quality management. Decision Sciences, 20(4).
  
7. AHMED, S.M. & KANGARI, R. March/April 1995: Analysis of client satisfaction factors in construction industry. Journal of Management in engineering, ASCE, 11(2).
  
8. GARVIN, D. A. 1983: Managing Quality: The strategic and competitive edge. London: McGraw-Hill.
  
- GARVIN, D.A. 1988: Quality on the line. Harvard Business Review, 61.
  
9. REEVES, Carol A. and BEDNAR, David A.: Defining quality: Alternatives and implications, The Academy of Management Journal Review, 1994, 19(3).
  
10. OMANCHONU, V. K. & ROSS, J. E. 1994: Principles of Total Quality. Delray Beach, FL.: St Lucie Press.
  
11. DEMING, W. E. 1986: Out of the crisis. Cambridge, MA.: MIT Center for Advanced Engineering Study
  
12. JURAN, J. M. 1988: Juran on Planning for Quality. New York: New York Free Press.
  
- JURAN, J. M. 1962: Quality Control Handbook. London: McGraw-Hill.
  
13. CHASE, G. W. October 1993: Effective total quality management (TQM) process for construction. Journal of Management in Engineering, ASCE, 9(4).
  
14. GRAVES, R. February 1992: Total quality – does it work in engineering management? Journal of Management in Engineering, ASCE, 9(4).
  
15. KUBAL, M. T. September/October 1996: The future of engineered quality. Journal of Management in Engineering, ASCE, 12(5).

16. CHASE, G. W. & Federle, M. O. October 1992: Implementation of TQM in building design and construction. Journal of Management in Engineering, ASCE, 8(4).
17. STRANGE, P. S. & VAUGHAN, G. D. October 1993: TQM: a view from the playing field. Journal of Management in Engineering, ASCE, 9(4).
18. FEDERLE, M. O. & CHASE, G. W. October 1993: Applying total quality management to design and construction. Journal of Management in Engineering, ASCE, 9(4).
19. DEMSKI, S. October 1993: Resistance to change: Why your TQM efforts may fail. Journal of Management in Engineering, ASCE, 9(4).
20. GRIFFIS, F. H. October 1992: ADR, TQM, partnering, and other management fantasies. Journal of Professional Issues in Engineering Education and Practice, ASCE, 118(4).
21. CULP, R.; SMITH, A & ABBOTT, J. October 1993: Implementing TQM in a consulting engineering firm. Journal of Management in engineering, ASCE, 9(4).
22. MALCOLM BALDRIGE NATIONAL QUALITY AWARD 1997 CRITERIA FOR EXCELLENCE, 1997: National Institute of Standards and Technology (NIST), Gaithersburg, Md.
23. CROSBY, P.B. 1979: Quality is free. New York: McGraw-Hill.
24. ANDERSON, J.C.; RUNGTUSANATHAM, M. & SCHROEDER, R.C. 1994: A theory underlying the Deming management method. Academy of Management review, 1(3).
25. BLACK, S. & PORTER, L. J. 1996: Identification of the critical factors of TQM. Decision Sciences, 27(1).

26. WORLD BANK. 1991: Urban Policy and Economic Development. An Agenda for the 1990s. (Washington: The World Bank).
27. RONDINELLI, D. A.: Decentralising Urban Development Programmes (USAID, 1990).
28. HAWLEY, W. D. & ROGERS, D. 1974: The Quality of Urban Management. London: Sage Publications
29. DAVEY, Kenneth: The Structure and Functions of Urban Government: Working paper no.1 – The Institutional Framework of Urban Management, Development Administration Group, School of Public Policy, University of Birmingham, UK., June 1992.
30. HOWARD, H.C., LEVITT, R.E., PAULSON, B.C., POHL, J.G., and TATUM, C.B.: Computer integration: reducing fragmentation in AEC industry, Journal of Computing in Civil Engineering, January 1989, 3(1)
31. DEMING, W.E., (1951): Elementary Principles of Statistical Control of Quality. Nippon Kagaku Gijutsu Remmei, Tokyo, Japan
32. MARCO, B. (1984): Managing for Quality in Ancient Rome. History of Arts Department, University of Pisa, Italy
33. LERNER, Franz. (1984): History of Quality Assurance in Germany: Sage Publishers. London.
34. MELENTEV, Yuri. (1984) The Old, the New, the Eternal. Raduga Publishers. Moscow.
35. BRITISH STANDARDS INSTITUTION (1977). Publication PD-4845.
36. NONAKA, IZUMI (1984): The Recent History of Managing for Quality in Japan. Josai University, Faculty of Economics, Japan.
37. JURAN, J.M. (1964): Managerial Breakthrough. McGraw-Hill. New York.

38. ISO 9001:1994 Quality Systems – Model for Quality Assurance in Design, Development, Production, Installation and Servicing.
39. ISO 9002:1994 Quality Systems – Model for Quality Assurance in Production, Installation and Servicing.
40. ISO 9003:1994 Quality Systems – Model for Quality Assurance in Final Inspection and Test.
41. ISO 9004-2:1994 Quality Management and Quality System Elements – PART 2: Guidelines for Services.
42. SABS 0158: 1987:
43. ISO 14001: 1996 Environmental Management Systems – Specifications with Guidance for Use.
44. CASCIO, J., WOODSIDE, G., MITCHELL, P. (1996): ISO 14000 GUIDE. McGraw-Hill, New York.
45. ABBOTT, J. (1996): Managing Cities in the Developing World, University of Cape Town, Inaugural Lecture.
46. PERLEMAN, J. (1991): Introduction: A Dual Strategy for Deliberate Social Change in Cities; Cities, pp 3-15
47. KOOIMAN, J. (ED) (1993). Modern Governance: New Government – Society Interactions; London: Sage.
48. DAVIDSON, F. AND NIENTIED, P. (1991). Introduction to a Special Issue on Urban Management in the Third World: Developing the Capacity; Cities, vol8, no.2 (May), pp 82-86.
49. BUTTON, K. J. 1976: Urban Economics: Theory and Policy. London: MacMillan Publishers.
50. BALCHIN, P.N. & KIEVE, J. L. 1985: Urban land Economics, Third Edition, London: MacMillan Publishers.

51. CHECKLAND, Peter. (1990): Soft Systems Methodology in Action. John Wiley, Chichester.
52. FEIGENBAUM, A. V. 1956: Total Quality Control. Harvard Business Review
53. VERHAEGHE, B.M. March 1994: Management and Improvement of Quality: Basic Principles. Pretoria: Sabita, DPVT-C/274-1.